THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

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PUBLISHED BY
THE GULF PUBLISHING COMPANY
HOUSTON, TEXAS

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Member Associated Business Papers, Inc.

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SPECIALIZED OIL JOURNALS
Published by
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The Oil Man's Calendar

FEB. 24	North Texas Oil & Gas Association, Wichita Falls, Texas.
MAR. 14-15	American Petroleum Institute, Mid-Continent District, Division of Production, Wichita, Kansas.
19	American Petroleum Institute, Pacific Coast District, Division of Production, Los Angeles.
28-29	American Petroleum Institute, Southwestern District, Division of Production, Houston, Texas.
31	Western Petroleum Refiners Association, Wichita, Kansas.
APR. 9-11	Society of Exploration Geophysicists, Chicago.
10-12	American Association of Petroleum Geologists, Chicago.
11	Society of Economic Paleontologists and Mineralogists, Chicago.
11-12	American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.
16-18	Southwestern Gas Measurement Short Course, Norman, Okla.
18-19	National Petroleum Association, Cleveland, Ohio.
26-27	Petroleum & Natural Gas Conference, State College, Pa.
MAY 1- 3	Petroleum Industry Electrical Association, Dallas, Texas.
6-10	American Gas Association, Natural Gas Section, Houston.
15-17	Natural Gasoline Association of America, Tulsa.
16-18	National Oil Scouts and Land Man's Association, Little Rock, Arkansas.
18-25	International Petroleum Exposition & Congress, Tulsa.
27-31	American Petroleum Institute, Mid-Year Meeting, Ft. Worth, Tex.
JUNE 1	Illinois-Indiana Petroleum Association, Robinson, Ill.

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Published every Monday. Single Copies 15 cents (Special Issues 50c). Subscription price: domestic and foreign, $2.00 a year; 2 years $3.00. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879. Subscription restricted to those engaged in the producing and pipe line branches of the oil industry or the manufacturing and distribution of oil field supplies. Advertising rates on application.

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THE OIL WEEKLY

FEBRUARY 19, 1940

VOLUME 96 NUMBER 11

The Week's Panorama

CURTAILMENT of industrial activity in the United States since the beginning of the year has been considerable, and there are some fears of a serious recession.

But reassurance has been given by the recent behavior of the sensitive barometers, security and commodity prices. Having displayed rising tendencies, those prices have seemed to foreshadow a resumption of brisk business activity.

Meanwhile, the slowing down of factories and mills has not been great enough to have appreciable effect on employment or consumer purchasing power; and sanguine business men continue to hope that 1940 will be an exceptionally good year.

Much Gasoline . . . . . .

Trouble with gasoline stocks is increasing. In the week ended February 10 the exceptionally large quantity of 2,312,000 barrels was added to storage. Having risen to 91,649,000 barrels, the inventory was within 1,500,000 barrels of the all-time peak that was reached March 19, 1938. Another addition in the week of February 17 similar to those of recent weeks would break the old record.

The gasoline stocks are about 13 percent greater than at this time last year, whereas demand is up only around 5 percent.

Crowding Storage . . . . . .

Information on the amount of storage space available for gasoline is not available. But evidence may be furnished within the next two months, as further additions similar to those so far this winter likely could not be extended through March without pushing gasoline to the roofs of all available tanks.

The ceiling possibly may be around 95,000,000 barrels, in which event it likely will be reached early in March.

It is believed by some economists that gasoline taxed storage facilities in the spring of 1938 in reaching 93,192,000 barrels, as that level was touched as early as March 19, after which stocks were about stationary for several weeks.

Even if that was the capacity then, however, it may be substantially larger now.

Cold Weather . . . . . .

It is evident that building up of the large gasoline inventory has not been wholly intentional. The extremely cold weather has made unavoidable large runs to stills, for supplying the abnormally great demand for heating oil; and large output of gasoline has been forced.

The 2,312,000-barrel addition to gasoline stocks in the week ended February 10 occurred because daily runs to stills were increased 65,000 barrels. And even then the industry was obliged to take 854,000 barrels of light fuel oils out of storage and also 192,000 barrels of heavy fuel oils.

Fuel Oil Stocks . . . . . .

Despite the exceptionally large crude runs to stills this winter, the relative scarcity of fuel oils has increased. Supplies of heating oils now are around 15 percent smaller than at this time last year, although demand has been around 15 percent larger. Stocks of industrial fuel oils are about 11 percent smaller than a year ago, whereas demand is up by a similar percentage.

Oil Exports . . . . . .

Combined exports of crude and refined oils from the United States were 3.1 percent smaller in 1939 than in 1938, having declined from 185,493,793 to 179,701,638 barrels.

Chiefly responsible for the decrease were declines in shipments of crude oil, natural gasoline, and gasoline, which more than canceled gains in exports of kerosene, lubricants, greases, and gas oil and distillate fuels.

The outbreak of war did not greatly change the petroleum export situation as a whole, although it led to increased shipments of some products, including lubricants, light fuel oils, and kerosene.

Equipment Exports . . . . . .

Some oil field equipment manufacturers are anticipating gains in foreign business this year, although others expect to export about the same amount in 1940 as in 1939. It is believed that there will be more drilling in the British empire and in countries where the governments operate oil properties, such as Russia, Argentina, and Brazil, but that exports of equipment will be limited by availability of exchange. Venezuela and Colombia may furnish more drilling, it is believed, and manufacturers hope for gains in exports of equipment to those countries.

For years, considerable equipment, such as derricks, tubular goods, cement, and wire rope, has been shipped from Europe into the oil fields abroad. And at least to the extent that such shipments are curtailed by war and replaced by shipments from the United States, the foreign business of the American manufacturers may be expected to increase. The amount of this shifting of business to the United States will be limited, however, by the availability of exchange.

Crude Markets Firm Despite Surplus Gasoline

By L. J. LOGAN, Associate Editor

DESPITE the current weakness of gasoline prices and the depressed prices of crude and fuel oil in California, the crude oil markets are remarkably firm practically everywhere in the United States outside the Pacific Coast region.

This is the rather surprising conclusion that has been reached through a nation-wide survey of the current market situation by the staff men of this publication.

The conclusion is well substantiated, moreover, by significant circumstances and statistics.

From Michigan to the Gulf Coast, and from the Rocky Mountains to Pennsylvania, producers are finding steady demand for their crude at the posted prices.

No difficulty is encountered in having new wells connected to the established pipe line systems; and in some areas, purchasers are actively competing for new connections.

It is true that now, as practically always, some new or isolated fields have limited markets, and that some flush fields are producing in excess of firm demand. But these are exceptional cases. And offsetting them are other exceptional instances in which fields are not supplying all the crude that could be sold at the posted prices or even for small premiums.

On the whole, therefore, the crude markets east of California may be described as on a normal basis and generally firm, with demand good.

Purchases are being made generally on a hard-headed trading basis; and if there is any slight advantage between sellers and buyers, in the aggregate, it probably is on the side of the sellers.

In other words, the crude market appears to be well in balance; but if any changes in prices should occur in the immediate future, they more likely would be increases rather than reductions.

It is not assured, of course, that this favorable situation for the seller of crude will be maintained; although most circumstances are encouraging.

An unforeseen slackening of current record-breaking demand for petroleum products could occur but is not seriously threatened, and so the outlook for the crude market is promising from the standpoint of demand.

Flush new fields in unprorated or inadequately controlled states, or loosening of production restrictions in prorated states might depress the markets with surplus crude; but no serious over-production is threatened. Meanwhile, crude stocks are exceptionally small, being still near the 17-year low level that was reached last

Strong Crude Market

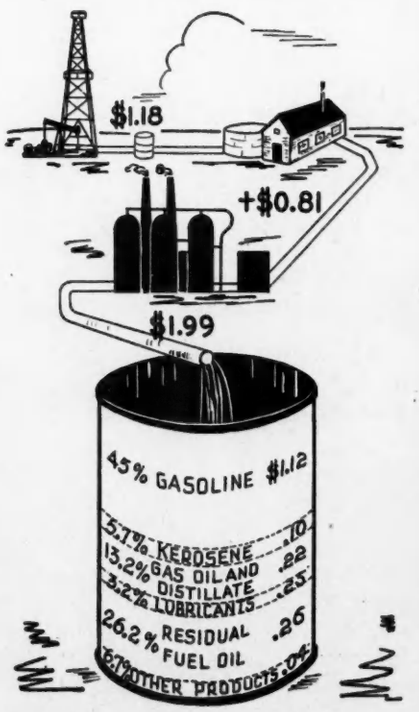
FEBRUARY, 1936

Crude price embodied 10-cent increase of early January, 1936, as products sold at relatively good prices.

Stronger Crude Market

FEBRUARY, 1937

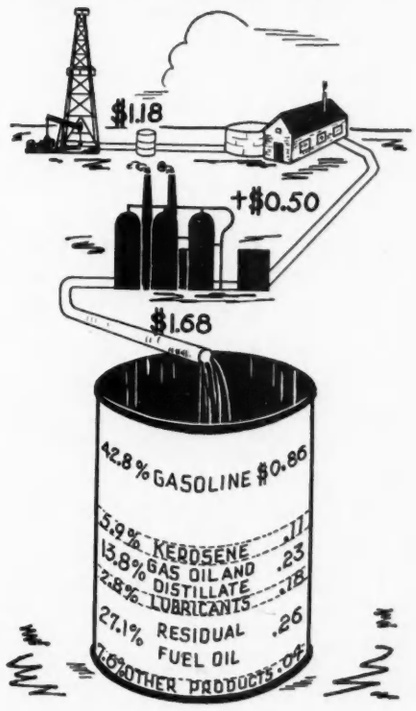
Crude price embodied 12-cent increase of late January, 1937, as products sold at exceptionally good prices.



Shaky Crude Market

FEBRUARY, 1938

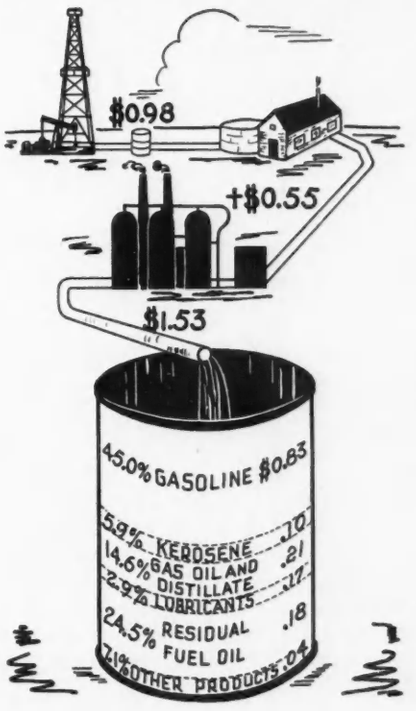
Crude price was shaky at previously established high level, as prices of gasoline and other products sagged.



Weak Crude Market

FEBRUARY, 1939

Crude price was unsteady, despite 20-cent reduction of October, 1938, as gasoline prices were extremely low.



fall. Therefore, the crude market outlook appears good from the viewpoint of the balancing of supply with demand.

This national survey of the crude oil markets was undertaken because of increasing anxiety, generated by the protracted weakness of the gasoline market and accentuated by the recent reductions of crude oil prices in California.

Gasoline stocks are exceptionally large, and the indicated surplus of over 10,000,000 barrels has depressed prices almost to the extremely low levels of this time last year. Consequently, the refiner's return for his "money crop" is relatively low. And it logically has been questioned whether or not he would be able to continue to pay the prevailing prices for his raw material.

Investigation reveals, however, that the present low gasoline prices are fairly well compensated by the comparatively good prevailing prices for fuel oils, lubricants, and other products. What the refiner has lost by sagging of gasoline prices he has largely regained by advances of other products.

As indicated in accompanying drawings and tables, the refining industry as a whole is obtaining practically as much return now from a barrel of crude as it did last November, despite a decline of about one half cent a gallon in the refinery price of gasoline. Consequently, the refined oil markets justify the established crude postings practically as well now as they did last fall, when there was talk of the possibility of crude price increases.

The refiner currently obtains considerably more for the derivatives from a barrel of crude than he did at this time last year—around 20 cents a barrel more; although he is paying about the same price for the crude. It must be conceded, of course, that the refinery prices a year ago were extremely low; that refinery operations then were conducted at losses in many instances; and that those prices, while they lasted, seriously threatened to pull down crude postings.

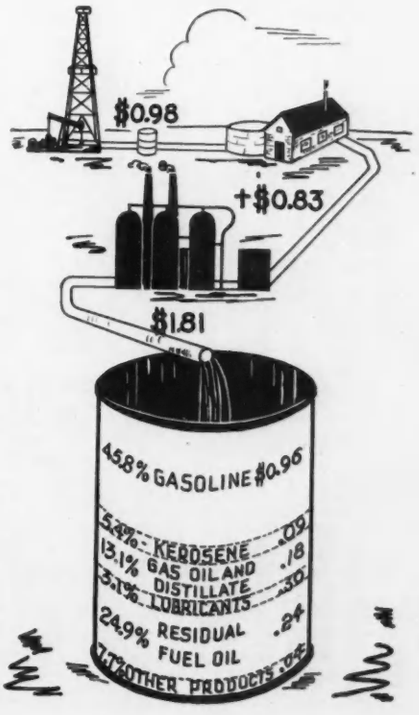
The sum now received by the refiner for all the derivatives from a barrel of crude is about the same as that which he obtained two years ago, in February, 1938, when he had to pay 20 cents a barrel more for crude than the present price. However, he was not able to pay that price for crude and show reasonable profit; and as product prices continued to decline, it finally was necessary that crude prices also be reduced, in October, 1938.

These figures indicate that in the light of past experience, cur-

Improved Crude Market

NOVEMBER, 1939

Strict crude control and sharp improvement of product prices prevented threatened crude price reduction.



Steady Crude Market

FEBRUARY, 1940

Weak gasoline market is disturbing, but good prices of other products help maintain refiner's margin.

Summary of Data on Prices of Crude Oil and Refined Products in Recent Years, Showing How Crude Postings Have Been Affected by Prices Realized for Derivatives

ITEM	February, 1935	February, 1936	February, 1937	February, 1938	February, 1939	November, 1939	February, 1940
Crude Oil, 34°-34.9° gravity, Oklahoma, per barrel, at well	$ .96	$1.06	$1.18	$1.18	$ .98	$ .98	$ .98
Refined Products, Cents per Gallon, at refinery, in Oklahoma:							
Gasoline, 67-69 octane	4.58	6.19	5.94	4.75	4.375	5.00	4.50
Kerosene, 41°-43° gravity, w. w.	3.58	3.69	4.22	4.28	4.00	3.87	4.00
Distillate, No. 1 straw	3.13	3.44	3.97	4.06	3.50	3.37	3.62
Lubricating Oil, 150-160 viscosity at 210°, bright stock, 10-25 pour test	13.25	16.50	18.25	15.25	14.25	23.25	23.75
Bunker C, Fuel Oil (Dollars per Barrel for Ships, at Gulf Coast)	1.00	.90	1.00	.95	.75	.95	.95
*Other Products	1.14	1.26	1.40	1.40	1.16	1.16	1.16
All Derivatives of Barrel of Crude, aggregate price at refinery	$1.59	$1.93	$1.99	$1.68	$1.53	$1.81	$1.75
†Difference between price of crude per barrel at well and value of derivatives at refinery	$0.63	$0.87	$0.81	$0.50	$0.55	$0.83	$0.77

* Wax, coke, asphalt, road oil, still gas, and miscellaneous products; price per gallon estimated at 50 percent of value of crude oil per gallon.
† Covers transportation and other costs as well as refiner's margin for costs and profit, if any.

rent prices of refined products give firm support for established crude postings and possibly would support slightly higher crude prices.

Similar figures for the more prosperous years 1936 and 1937 also indicate an apparent soundness of the present relationship between the price of crude and the value of derivatives. In February, 1937, the refiner paid 20 cents a barrel more for crude than he now pays, but he realized about 20 cents more for the products that he obtained from each barrel. In February, 1936, the refiner was obtaining for his products about 20 cents a barrel more than he now receives, and he was paying only 8 cents a barrel more for his crude; but as he continued to obtain the relatively good prices for products, he was obliged to compete more aggressively for raw material, and the price of crude finally, just after the end of the year, was raised 12 cents a barrel, establishing a relationship similar to that now prevailing.

These figures for 1936 and 1937 indicate that substantial additional improvement of current product prices might be required to push crude postings to higher levels.

Findings of the members of the staff on the crude market situations in the various states and districts are herewith summarized.

Appalachian Region . . . Continued strong demand for lubricants assures stability of the markets for Pennsylvania grade crude at present greatly improved prices. All crude finds ready buyers.

Michigan . . . The market is firm. There is no visible selling of crude under posted prices. Independent refineries are buying approximately 55,000 out of 65,000 barrels produced daily in the state, and several independent refining companies are bidding for 500 to 1000 barrels daily of additional crude. No new major fields or reserves have been proved or are in immediate prospect, pointing to tightening of crude. Some Illinois crude is reaching Michigan in the Detroit area, but it is not entering in upsetting quantities.

Illinois . . . Production continues to increase, but demand keeps abreast. In isolated cases, where small local demand is concerned, the market is weak and shows the influence of purchasers' attempts to obtain price concessions, although sales continue generally within the established price range. Aiding the Illinois market are increased shipments to the East Coast. (A pipe line that formerly conveyed Texas crude from Philadelphia westward was shut down a year ago and on scheduled early resumption of operation will move Illinois crude eastward.) There is nothing to indicate a price change in Illinois or an unbalancing decrease in demand.

Oklahoma . . . The state is satis-

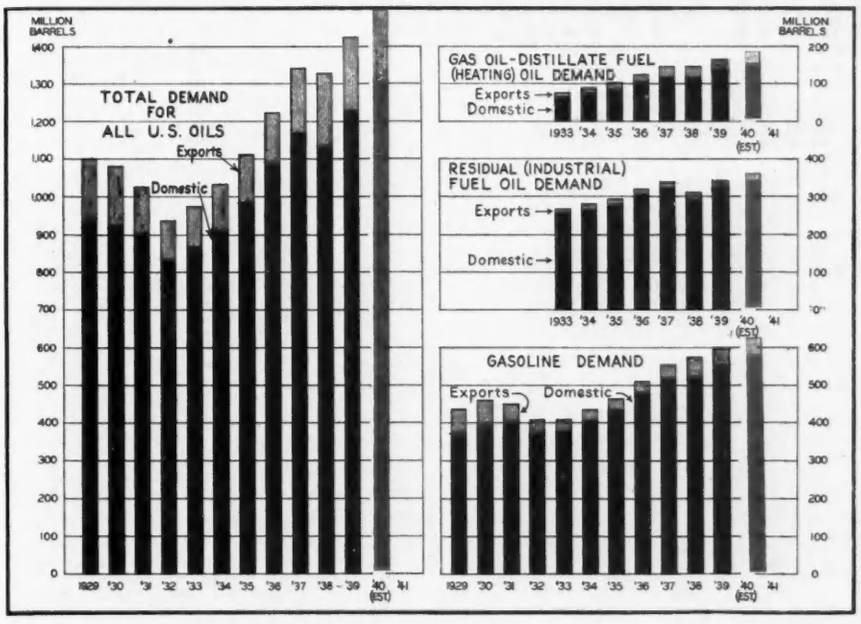
Crude Prices Show Response to Strength or Weakness of Markets for Refined Products

ITEM	February, 1935	February, 1936	February, 1937	February, 1938	February, 1939	November, 1939	February, 1940
Value of Crude at Well, 34°-34.9° gravity, Oklahoma, per barrel	$ .96	$ 1.06	$ 1.18	$ 1.18	$ .98	$ .98	$ .98
Yield from 42-gallon Barrel of Crude Oil, and Value at Refinery:							
Gasoline:							
Percent	46.3	45.6	45.0	42.8	45.0	45.8	*44.0
Gallons	19.4	19.2	18.9	18.0	18.9	19.2	18.5
Cents per gallon, 67-69 octane, at refinery, in Oklahoma	4.58	6.19	5.94	4.75	4.37	5 00	4.50
Value at refinery, cents	88.90	118.87	112.33	85.52	82.60	96.00	83.25
Kerosene:							
Percent	6.8	5.5	5.7	5.9	5.9	5.4	*5.5
Gallons	2.85	2.31	2.40	2.48	2.48	2.27	2.31
Cents per gallon, 41°-43° gravity, w.w., at refinery, in Oklahoma	3.58	3.69	4.22	4.28	4.00	3.87	4.00
Value at refinery, cents	10.20	8.52	10.12	10.61	9.92	8.78	9.24
Gas Oil and Distillate Fuel:							
Percent	9.9	13.6	13.2	13.8	14.6	13.1	*14.6
Gallons	4.16	5.71	5.44	5.79	6.13	5.50	6.13
Cents per gallon, No. 1 straw distillate, at refinery, in Oklahoma	3.13	3.44	3.97	4.06	3.50	3.37	3.62
Value at refinery, cents	13.20	19.64	21.59	23.50	21.45	18.53	22.19
Lubricants:							
Percent	2.9	2.7	3.2	2.8	2.9	3.1	*3.3
Gallons	1.21	1.13	1.34	1.17	1.21	1.30	1.38
Cents per gallon, 150-160 viscosity at 210°, bright stock, 10-25 pour test, at refinery, in Oklahoma	13.25	16.50	18.25	15.25	14.25	23.25	23.75
Value at refinery, cents	16.03	18.64	24.45	17.84	17.24	30.22	32.77
Residual Fuel Oil:							
Percent	27.5	28.8	26.2	27.1	24.5	24.9	*25.5
Gallons	11.55	12.09	11.00	11.38	10.29	10.45	10.71
Price per barrel, Bunker C, for ships, at Gulf Coast	$ 1.00	$ .90	$ 1.00	$ .95	$ .75	$ .95	$ .95
Cents per gallon	2.38	2.14	2.38	2.26	1.78	2.26	2.26
Value at refinery, cents	27.48	25.87	26.18	25.71	18.31	23.61	24.20
Wax, Coke, Asphalt, Road Oil, Still Gas, Miscellaneous, and Losses:							
Percent	6.6	3.8	6.7	7.6	7.1	7.7	*7.1
Gallons	2.77	1.59	2.81	3.19	2.98	3.23	2.98
Cents per gallon, estimated at 50 percent of crude oil value per gallon	1.14	1.26	1.40	1.40	1.16	1.16	1.16
Value at refinery, cents	3.15	2.00	3.93	4.46	3.45	3.74	3.45
Total Value of All Derivatives of Barrel of Crude at Refinery	$1.59	$1.93	$1.99	$1.68	$1.53	$1.81	$1.75
†Difference between Price of Crude per Barrel at Well and Value of Derivatives at Refinery	$0.63	$0.87	$0.81	$0.50	$0.55	$0.83	$0.77

* Estimated.
† Covers transportation and other charges as well as refiner's margin for costs and profit, if any.

Demand Outlook Favors Crude Market, as Record Quantities of Oil Products Likely Will Be Made and Sold in 1940

Chart is based on Bureau of Mines data for 1929-1939 and estimates for 1940


MILLION BARRELS
TOTAL DEMAND FOR ALL U.S. OILS
Exports
Domestic
GAS OIL-DISTILLATE FUEL (HEATING) OIL DEMAND
RESIDUAL (INDUSTRIAL) FUEL OIL DEMAND
GASOLINE DEMAND
1929 '30 '31 '32 '33 '34 '35 '36 '37 '38 '39 '40 (EST) '41

fying a steady demand. It has one soft spot in the Cement area of Caddo County, the state's only flush field, where new and deeper production necessarily is prorated. Under-market prices for crude from some Southern Oklahoma fields are not new, and are based on quality slightly below the average.

Kansas . . . Situation is stable. Available production continues in excess of demand, but demand is constantly if slowly increasing. Unconnected fields represent the only soft spots, and they have been reduced in number in the past 18 months. An announced new 10-inch pipe line into Ellis County will provide additional market.

Texas . . . The Texas Panhandle is a bright spot, as crude stocks have been reduced below normal requirements. Current allowables are readily absorbed by independent refineries and trunk pipe lines. North Texas and West Central Texas refiners must pay posted prices to assure supplies, being able to obtain under-market crude only in pools isolated from trunk lines. In the East Texas field, major companies and independents are encountering active competition in obtaining new well connections. Purchasers in West Texas complained over reduced allowables of February, giving evidence the crude market was on a sound basis. The movement of crude from Southwest Texas is the most satisfactory in years; more would be taken if available; low-gravity oils are especially in demand, because of the strong markets for fuel oils and lubricants; and crudes rich in yield of high-octane gasoline are sought for aviation gasoline manufacture; these highly desirable crudes have been commanding premiums above posted prices in some instances. The Texas Gulf Coast, similarly, has strong markets, because of geographic advantage and desirable oils.

Louisiana . . . Both inland and coastal sections have firm markets, comparable with those in the corresponding divisions of Texas.

Arkansas . . . Markets are favorable, as in other sections of the Mid-Continent.

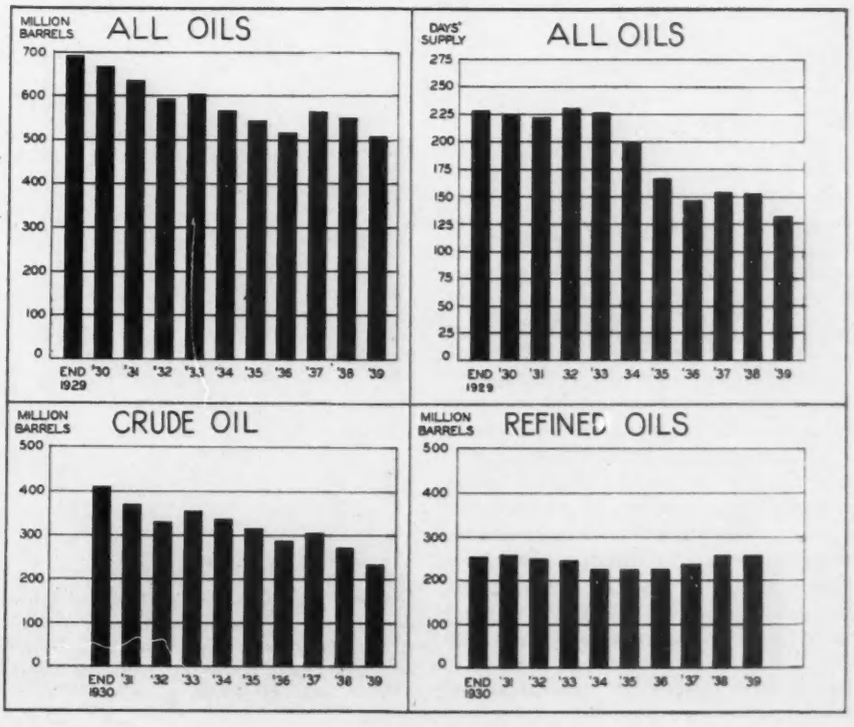
New Mexico . . . Situation is normal, with buyers still taking advantage of back-allowables.

Rocky Mountain States . . . Markets are entirely steady. No changes in prices are anticipated. Increased pipe line outlets are expected to widen the market from the present 85,000 barrels daily to around 100,000 barrels a day by summer.

California . . . There are some hopes that the recently reduced crude prices may be restored soon. The cut was made because of depressed prices for fuel oil, which is a relatively more important product in California than elsewhere. But the fuel oil market subsequently has shown some improvement.

Inventory Situation Is Conducive to Firmness of Crude Market, As Crude Stocks Are Unusually Low, While Stocks of Refined Products, Except Gasoline, Are Moderate

Chart is based on Bureau of Mines data



Pumping Series Article No. 36

Stress Peaks Relieved By Floating Rod String on Compressed Air

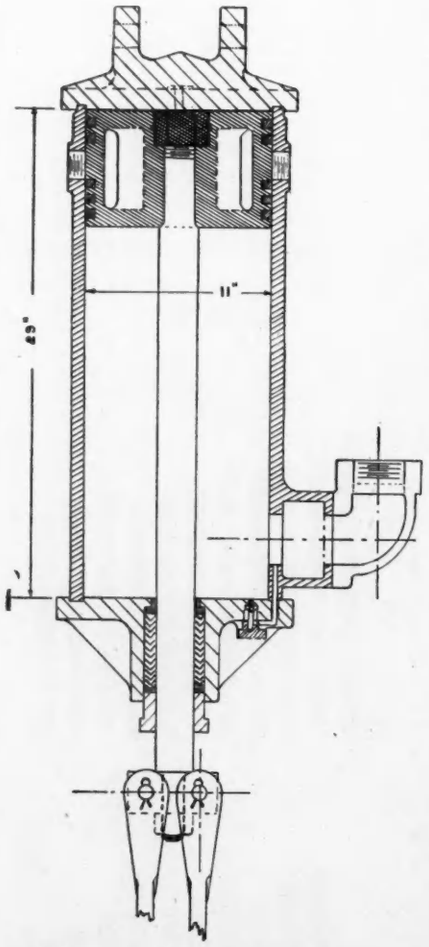
By FRANK B. TAYLOR, Staff Writer

ONLY part of the problem of pumping is concerned with lifting all the oil the well will yield. The balance of the problem is more directly concerned with the efficiency of lifting means, not in terms of barrels production, but in terms of the operating dollar. Inherent in operating and equipment maintenance costs are those items for replacement, pulling and reconditioning. Any means which will effectively minimize the frequency of these items is important to the producer.

Analysis of a normal pumping stroke on a beam unit shows the rods descending under little or no strain. At the lower end of the stroke the string comes to a momentary stop, then starts to ascend. The load rapidly increases as the speed of rod travel increases, reaching a maximum half way through the up-stroke. The stress on the rod string also increases, reaching a maximum at or near the half way mark.

The mean effective load on rods during the up-stroke is very seldom excessive, being well within stress ranges the rods are capable of handling. Instead of the ideal load curve, the mechanics of the motion produce a peak stress at some points of the cycle which may be thousands of pounds greater than the maximum load for which the rod string was designed. It appears evident that continual subjection of a string of rods to these excessive peaks of stress is a chief cause of fatigue, and hence of failure.

The relieving of this stress peak on wells giving considerable sucker rod trouble was the problem of engineers of The Pure Oil Company; and to accomplish their object they employed the shock-absorbing power of compressed air, which also is being used successfully for this purpose on some new type pumping units that have been placed on the market. In the alleviator designed by the company, the rod string is neither directly nor rigidly connected to the beam through polish rod and clamp. Instead, the rod string is connected to the rod of a piston supported over compressed air, the cylinder holding the air being fixed to the end of the beam of a standard beam pumping rig. This leaves the rod string mechanically independent of the beam.



Construction details of piston and cylinder. Piston is shown at upper end of stroke, compressed air inlet to cylinder at lower right. Breather ports on either side of piston position.

A normal installation makes use of a cylinder having an inside diameter of 11 inches and an operating stroke of about 20 inches. Compressed air is introduced into the cylinder below the piston, operating pressure being about 170 pounds per square inch. The energy exerted by the gas against the piston above it is sufficient to hold the piston at the upper limit of the cylinder except during periods of peak stress. The piston rod may be said to "go through" the piston for it extends down through the compressed air and through packing in the center of the cylinder. The polish rod is clamped to the piston rod extension.

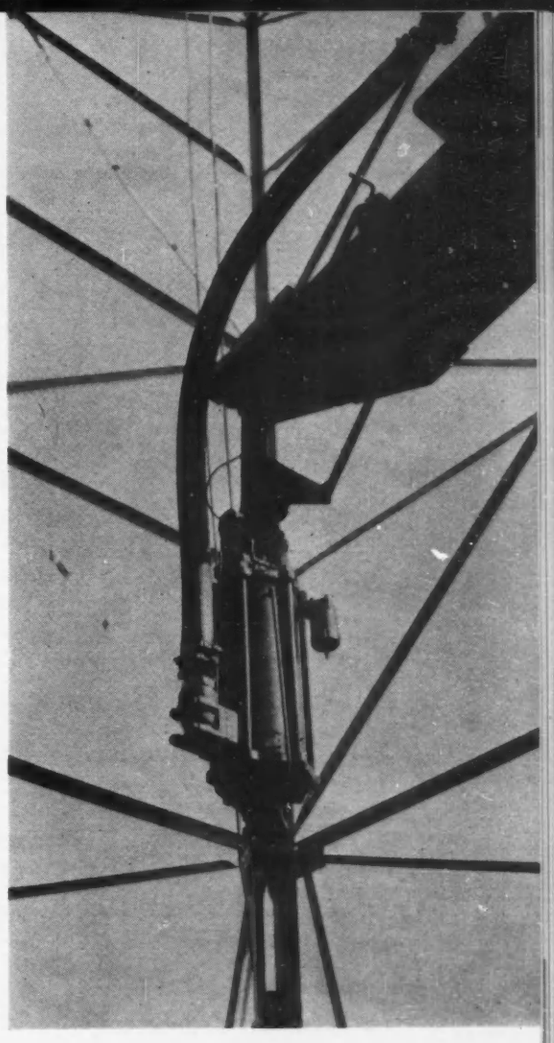
With correct pressure of air, the supporting force is sufficient to keep the piston always at the top of the cylinder while the unit is not in operation. At such time, the rod string weight is less than the upward thrust of the compressed air. In operation on the down stroke the piston remains at the top of the cylinder, but during the up-stroke the compressed air must support not only the weight of the rod string, but the fluid load as well. Under this circumstance the downward pull of the rod string, or the resistance of the rod string plus the fluid column to be lifted, is in excess of the energy of the compressed air supporting the piston at the upper end of the cylin-

der. As a result, the piston is drawn down part way through the cylinder. As soon as the momentary load peak is passed, the air pressure pushes the piston back to its normal position in the top of the cylinder.

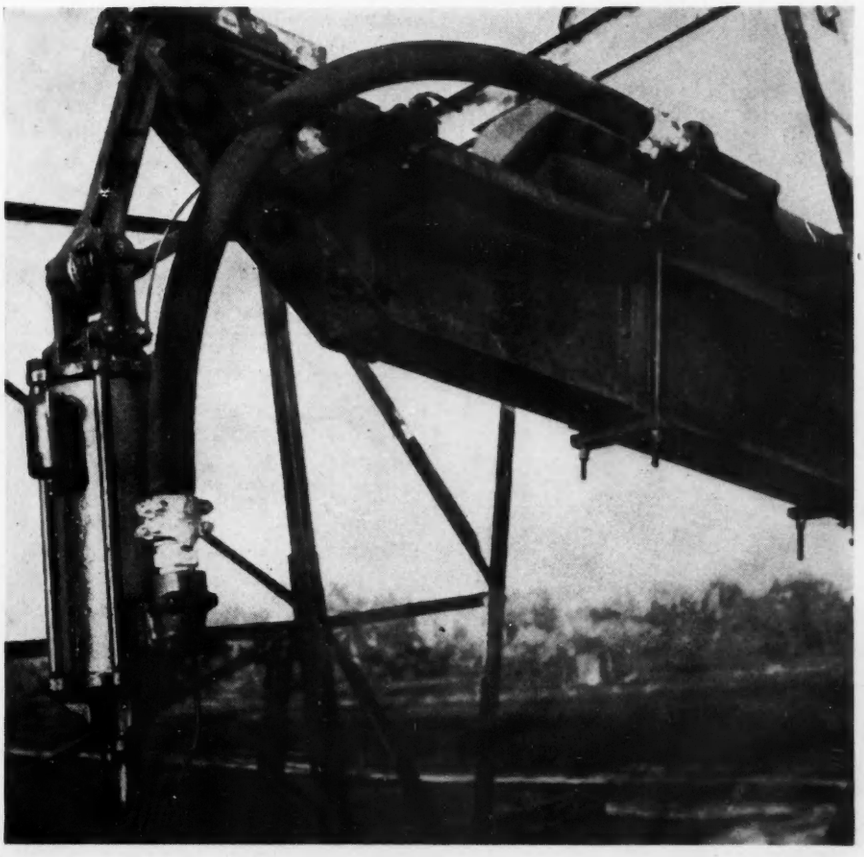
Consequently, the upward motion of the end of the beam is somewhat faster than the upward motion of the polish rod during high stress phases of the stroke, this resulting in spreading the stress peaks out.

When the peak stresses of the up-swing are passed the force of the compressed air or gas within the cylinder is again greater than the downward pull on the polish rod. At this point the piston is forced upward within the cylinder, exceeding the speed of the beam, increasing the stresses during this portion of the stroke in which the normal stress would be low, and completing a full stroke with the piston at the top of the cylinder. In this manner the alleviator "knocks off" the high stress peaks, distributing them into a relatively flat curve, every portion of which is within the range of stress tolerance.

The cushioning effect of the alleviator might be compared with the action of a rubber band stretched under a normal weight. If the weight is increased, the band will further extend itself. It will return to its former length immediately if the added weight is removed. The air beneath the piston of the alleviator in this manner cushions off the stress peaks, returning to complete a full stroke when the peak phases of the upstroke are passed. To overcome the peaks, the piston is below the head of the cylinder during from ⅔ to ¾ of the upstroke. Too much pressure under the piston would hold it against the top of the cylinder during the entire stroke as the upward energy of the air would be greater than the downward pull of the rod string, too little pressure would fail to give sufficient support to the piston and it would be pulled down against the head of the cylinder during periods of peak stress, and possibly not return to the top of the cylinder when the beam reaches the top, resulting in loss of stroke.



Reverse side of cylinder showing second breather, pointer, and manner of connecting to polish rod.

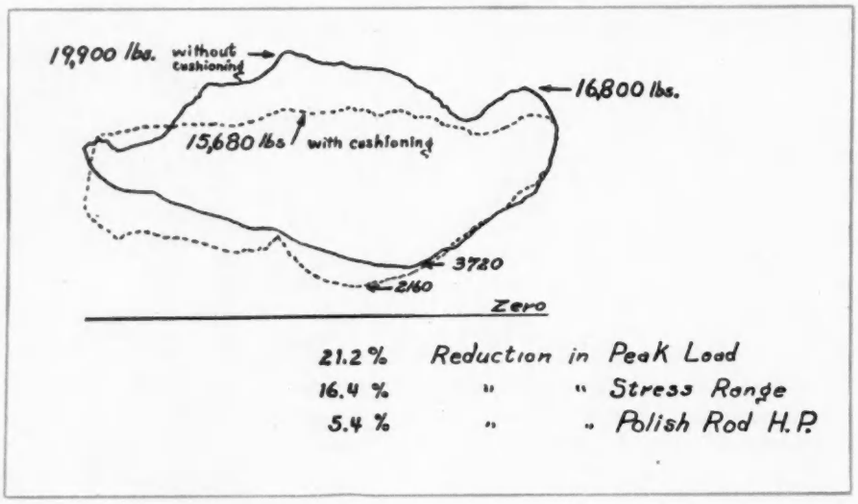


Closeup of cylinder showing hose, manner of connecting to beam, and one breather.

Results of Alleviation

Dynamometer cards with and without the alleviator show the degree of cushioning of rod stress peaks. On a well in the Seminole area the normal maximum load was shown to be 19,900 pounds. With alleviator installed the maximum load was reduced to 15,680 pounds, a reduction of 4220 pounds, or 21.2 percent. At the same time, the stress range was reduced 16.4 percent and the polish rod horsepower was reduced 5.4 percent.

On another well in the same area the normal peak load was found to be 17,800 pounds. After installation of the alleviator, the peak was reduced 4500 pounds to 14,300. This decrease brought about a reduction in the stress range of 28.6 percent and a polish rod horsepower reduction of 10.4 percent. These two cases are representative, not exceptional. Both wells were operating in the 22 to 26 strokes per minute range on 56-58-inch beam strokes. One well was 4100 feet deep, the other 4400 feet. There was no change in well arrangement other



than the installation of the new equipment.

On these wells, which may be considered relatively shallow, the stroke of the piston is satisfactory at 15 inches. However, in deeper production, as from 6400 feet at Oklahoma City, it was found that a longer stroke, in the order of 20 inches, was more desirable. A greater stroke length results in a further load reduction.

Rod Life Increased

With consequent reduction in polish rod horsepower and stress peaks an increased rod life was to be expected. This has been proven on a number of wells. As an instance, the first installation of an alleviator was made on Pure Oil Company's Harjo 3, Little River field, Seminole County, Oklahoma. During the 16 months of operation prior to the use of the alleviator, one partial and three complete new rod strings were run in in addition to one rod break repair per week. During nine months following the installation rod jobs averaged one per month, none being major replacements. This record is more significant when it is considered that the rod string in Harjo 3 normally would have been replaced even before the alleviator was installed, having already served a maximum life.

Rod Jobs Decreased

On another well, there were 21 rod jobs in 240 operating days. The alleviator was then installed and during the next 300 days there were but nine rod jobs. This well had a combination string of 1500 feet of ⅞-inch and 2475 feet of ¾-inch rods. Analysis shows that of the total number of breaks prior to the installation of the alleviator, five were in the ⅞-inch, the remaining 16 being in the ¾-inch. After the alleviator was put on, there were no breaks in the ⅞-inch, the ¾-inch breaks being reduced as stated.

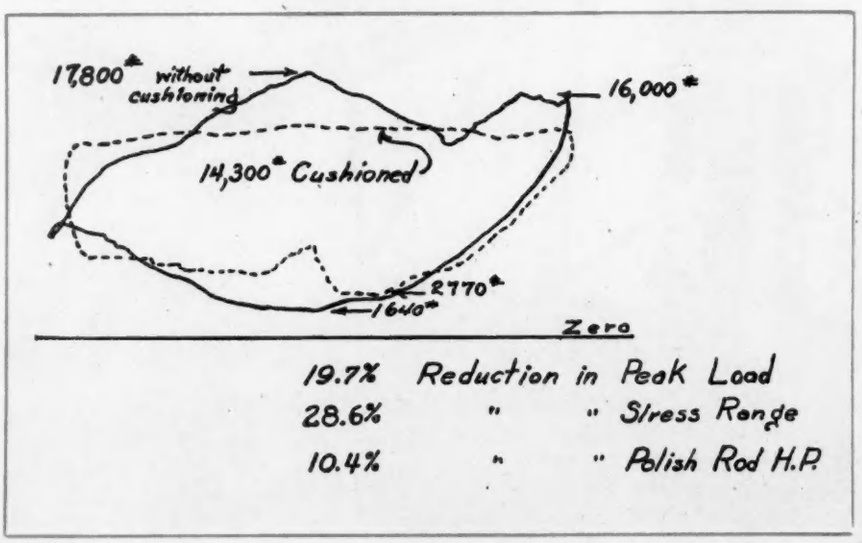
Air to actuate the alleviator is compressed in a two-stage, 4 x 2¼ x 3½-inch air-cooled compressor driven by two V-belts off a pulley next to the outboard bearing on the clutch shaft of the pumping engine. This compressor delivers air about one sixth the time, has an unloader set at 200 pounds and delivers air at that pressure into a nearby tank. From this primary chamber, the compressed air goes through a regulator set at the operating pressure, around 170 pounds for 4400-foot wells. The regulator is shunted by a valve-controlled by-pass. A pressure gauge on the discharge side of the 170-pound regulator and an automatic switch to shut down the engine if the pressure on the alleviator falls some fifteen pounds under operating pressure, which would occur in case of a rupture in the pressure system, completes the installation of equipment to the beam.

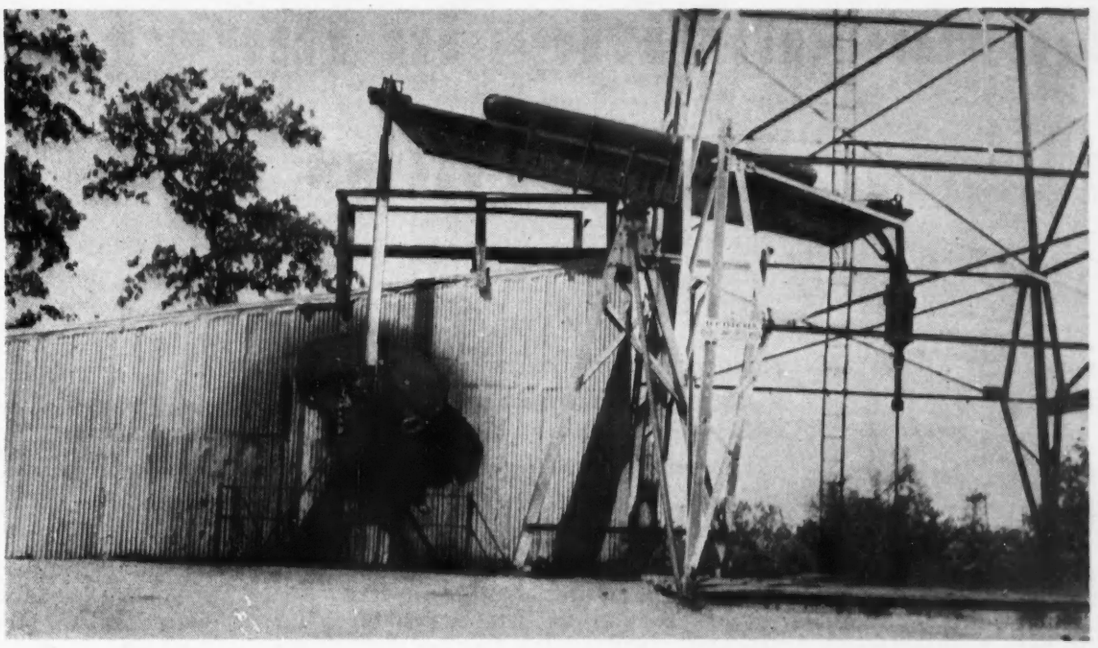
ON THIS PAGE, above and below, are pictured typical examples of "Before and After" indicator cards showing moderation of peak stresses. Note depressed maxima and the trend toward flattened curve.

Cylinder Function

The cylinder enclosing the alleviator piston is swung from the end of the beam. The extended piston rod passes through the lower end of the cylinder and is clamped to the polish rod. At this connection, a ¼-inch rod with a pointer at the top is attached to the piston rod as an indicator. As the piston falls, the pointer indicates its position on a scale marked on the outside of the cylinder. When pulled away from its normal position at the top of the cylinder, the piston would create a vacuum if enclosed. To overcome this action the portion of the cylinder above the piston is open to the atmosphere through two breathers, which also function as chokes, preventing the piston from slamming into the cylinder head in case of removal of entire load, as would occur if the polish rod snapped off.

On the lower side of the piston, the compressed air acting against the piston would be very highly compressed with but a small portion of the necessary stroke of the





Complete and operating installation on Pure Oil Company's Cotcha 7, Seminole area, Oklahoma. Other units are in use in Oklahoma City, Little River and in Michigan fields.

unit if it were to be confined within the cylinder. The piston on the drawdown would build excessive pressures, minimizing the stroke to but a few inches of travel. To overcome this the lower section of the cylinder is open into a buffer tank that receives the air displaced by the piston on the down stroke and returns it to the cylinder as the rod load decreases to drive the piston to a higher position.

The buffer, or surge tank, is mounted on the top of the beam, being secured in place with "U" bolts. It is necessary that the buffer tank be of sufficient capacity that the pressure exhausted from the cylinder does not build up too greatly, and also that sufficient reservoir capacity is present so that the magnitude of surges are greatly reduced. On 4500-foot wells a capacity of 19-20 cubic feet has been found adequate. The tanks used as buffers are made from 16-inch pipe, welded to withstand necessary pressure.

There must be very little resistance to the free flow of the gas or air being displaced beneath the down-plunging piston during the up stroke of the beam. To assure such condition, a direct connection is made between the cylinder and the surge tank, this being of three-inch rubber hose internally and exteriorly lined with synthetic rubber. No restrictions being present, the flow of gas is swift and sensitive to minute changes of load on the piston.

One-inch pipe is used to deliver air to the surge tank. A quarter-inch reducing regulator is used on the feed line to the surge tank. Lubrication of the piston is obtained by means of a pressure lubricating unit driven off the beam. Approximately one pint of oil is required per 24 hours of operation.

One style of control manifold being used in connection with the surge tank supply. Pressure gauge at left, automatic switch at right, the latter connected to the engine ignition system.

Considerations

Stress peaks are controlled in the alleviator by a reduction in foot-pounds of energy applied during the moments when stresses are maximum and an increase in foot-pounds of energy when the load is normally low. There is no loss of actual energy applied to the operation of lifting, for after the momentary stresses diminish past normal, the applied foot-pounds of work are continued in the form of increased upward speed of the polish rod. Functionally, the load is distributed over the entire upward polish rod stroke, instead of being localized through part of the stroke.

Results of some 17 installations now made in various fields indicate a considerable reduction in rod jobs. In a few instances production is increased, although as the stroke length remains the same as without alleviation, the difference is slight. There is a minimum of operation cost. The economies are concerned with installation costs as compared with greater rod life and continuous operation.

Oil Possibilities in the "Last Wilderness"

By W. C. LEHMAN
Manager, Mutual Exploration Company,
Kalaloch, Washington

PROBABLY the least publicized prospective oil area of the United States in which wildcat drilling has been going on in recent years is what has been called the "last wilderness"—the Olympic Peninsula, in the State of Washington. Responsible for its name has been the fact that, having the greatest annual rainfall of any part of continental United States, the forest growth and underbrush make many parts of it almost impenetrable, and, for many years nearly all of it could be traversed only by trail. During the last five years, however, a first-class motor highway has been cut through the very heart of it and many side roads now open up what were previously inaccessible areas.

Interest in its oil possibilities dates back many years. About ten years ago the writer had a communication from a member of the Galey family in which he related the incidents of his investigation of a long time ago for that great wildcatting firm, Guffey & Galey, of Pittsburgh. It must be forty years since they were active operators.

Oil Seepages

The first large oil seepages were found in bear wallows. In many places where the oil impregnates the shale the Olympic Indians still invariably refer to the material as "smell mud," which is a good enough name. The natural gas vents, some of which are astonishing, are well described by the United States Geological Survey[1] in its report of the reconnaisance of the area by Charles Lupton. Incidentally, it may be mentioned, in connection with the natural gas of the region, that a well drilled under the writer's direction last year, produced gas with a gasoline content of 2½ gallons to the thousand feet. The volume was too undependable, it was felt, for the installation of a compression plant with the additional necessity of providing for stabilization.

Several Tests Drilled

The first wildcat wells were drilled on the peninsula after the operators had surmounted the almost impossible obstacles of transportation. The equipment had to be landed on the open beach, and that's a ticklish job anywhere in the North Pacific. Then the material had to be dragged to the well locations either in scows up the swift-flowing rivers and over sandbars or over a laboriously constructed skid-road by the means of a donkey engine. So much of the available capital was generally expended in getting the drilling outfit to its location, the local companies had seldom enough money left to drill anything but shallow holes, and drilling efforts were abandoned when an additional string of casing was required. Of course, these early prospects were drilled with cable tools before the advent of the rotary. One well was drilled with a Canadian Pole Rig, a kind of outfit that only the oldest operators of the present day even remember.

During 1932, Leslie Petroleum Company landed a cable tool rig on the beach near the mouth of the Hoh River and, at a depth of 700 feet, at a location two miles north of the landing place, found the most substantial accumulation of oil discovered up to that time. The well bailed 40 barrels the first day and had all the evidence of being a small producer. However, at no time thereafter did more than a few barrels accumulate in the hole. The next year, with the completion of the first link of the new Olympic Highway, a light rotary was brought in. At a nearby location a well was drilled and cored to the same depth. The same local accumulation was found but the core made obvious the fact that the fold had been so severely faulted that all gas and water pressure had escaped. Near by, during 1936, another well was drilled on the same structure that pumped five barrels an hour for seven or eight hours only to discontinue production, except for a few barrels, thereafter.

During 1937, Sun Oil Company drilled a 6000-foot test near the town of Forks, about 15 miles northeast of the mouth of the Hoh River. Though several electrical core surveys seemed to indicate potential production, efforts to bring the well in resulted in failure, and it was abandoned. However, the Sun Company has since increased its leased block and it is understood that another well will be drilled.

Draws Attention

The finding of oil on the Hoh River drew the attention of the major oil companies in California and some of the independents. During the past three years a good many field geologists have collected data along the coast-line and the beds of the Olympic Peninsula rivers. It was discovered that perhaps the appellation of the "last wilderness" might have a geological as well as a topographical meaning. Difficult as an interpreta-

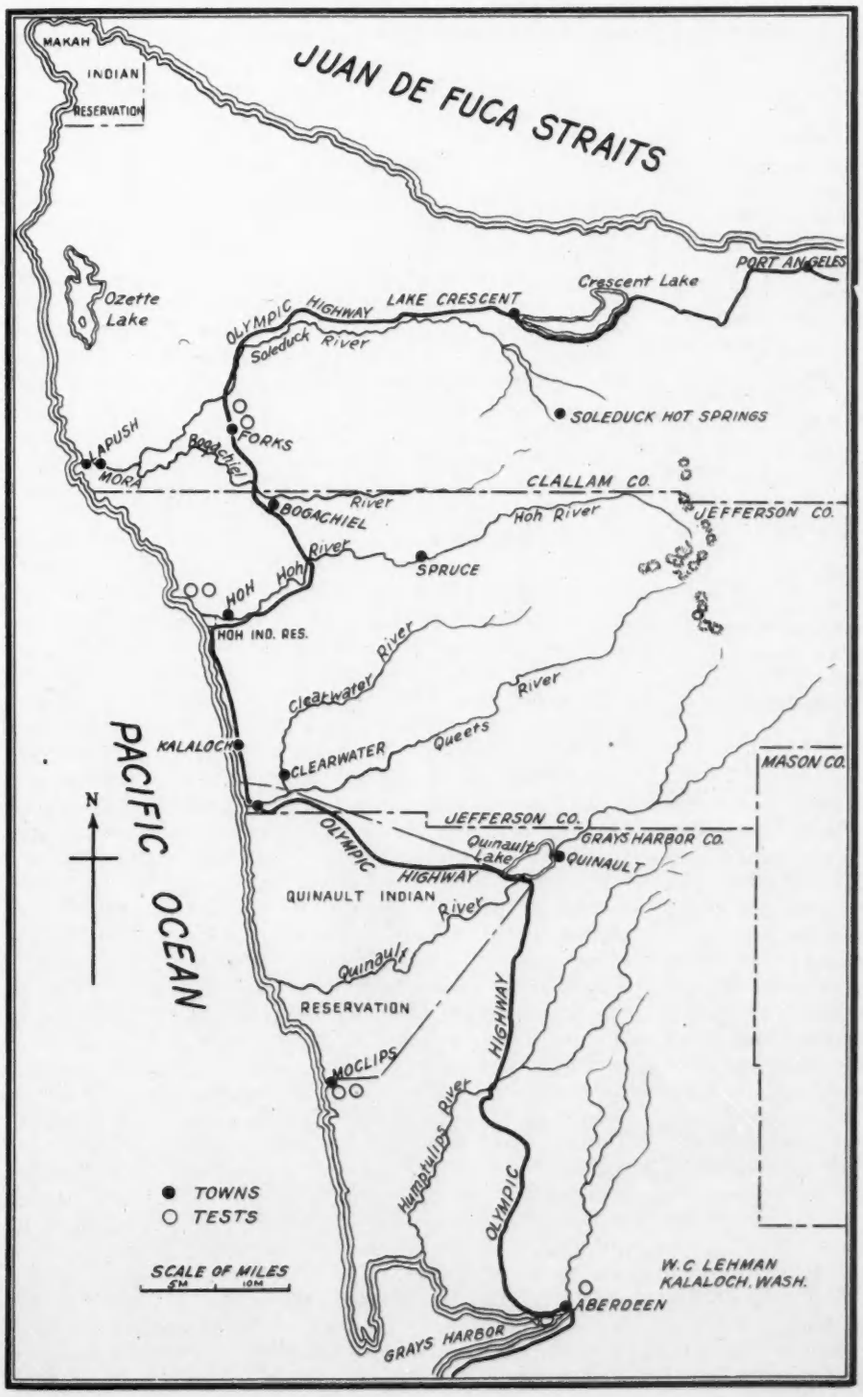
[1] Bulletin 581—U.S.G.S.

tion of the geology turned out to be, certain facts became apparent that explained, in part, the widespread oil seepages of the region.

Some controversial issues have been raised, particularly regarding the precise age of some of the formations, but the essential facts on which there is, perhaps, general agreement, permits the following statement of the geological setting:

The west side of the Olympic Peninsula constitutes a large remnant (about 2000 square miles) of what was the largest Tertiary marine basin along the coast of continental United States. The other two being the Los Angeles Basin and that which occupies the south end of the San Joaquin Valley. The age of the principal and dominant series of sedimentary beds, the Hoh formation, is undifferentiated Oligocene-Lower Miocene, being, in part, correlated with the oil producing formations of the San Joaquin Valley. This formation, consisting principally of marine beds, with interbedded lenses of material of terrestial origin, has a thickness in excess of 30,000 feet. It is in this series of beds that oil is found.

Outline map of the Olympic Peninsula area of the State of Washington. Circles indicate the location of tests that have been drilled for oil.



The structural instability of the peninsula, still evident, has resulted in the complicated folding and faulting of the sedimentary beds. A mantle of Pleistocene drift, from 50 to 300 feet thick, hides the cut through the till, along the river beds, where the current has cut through the till, along the coast line and a few isolated ridges and road cuts.

The working out of structure is, perhaps, as difficult as anywhere in the United States. Very few fossils have been found in the Hoh formation, though they are comparatively numerous in the limited areas of later Tertiary beds deposited unconformably on the Hoh series.

Hoh Formations Organic

The shales of the Hoh formation are highly organic and, in a series of tests in the writer's field laboratory, were found, in one part of the section, to contain invariably small portions of free oil. Some of the sandstones are coarse and porous but, as a rule, the Hoh sandstones are close-grained, composed principally of quartz, feldspar, muscovite, biotite and hornblende, and frequently grade into siltstone.

The recent geological work has quite definitely established the post-Eocene Tertiary age of all the marine sediments within the basin, set up several type sections, found igneous and metamorphic rock to be practically absent, discovered the derivation of the sediments. One part of the marine section requires closer trying in. Structure is another matter. Contradictory and superficial dips at angles from 40 degrees to vertical beds, serve to complicate many reasonable structural hypotheses. No doubt there are many first-class closed structures within the basin. The bringing in of commercial production on the Olympic Peninsula awaits their proper definition.

High Voltage Economy When Wells Are Wide Spaced

By W. C. LANE, Electrical Engineer

THE wider spacing of wells as a means of reducing the cost of developing and operating oil properties has caused changes in a number of practices heretofore regarded as standard. Some of these changes have caused new equipment to be developed and others the application of old designs to new uses. Controlled production limits the income from a property and makes it advisable for operators to scan every practice and to abandon or refuse to adopt those which involve unnecessarily large investments.

During the 20 years electrical energy has been used for pumping oil wells, 440-volt equipment has become the standard. Until recently close spacing of wells has been the practice and energy has been obtained from the secondary of transformer banks located near the load centers. Under these conditions the distribution lines are short and no difficulty has been experienced in reaching an economical number of wells without resorting to the use of excessively large cables. As a result of the experience accumulated during this time it has become general practice for engineers to limit the length of 440-volt service to ¼ mile unless loads are small. The current practice is to provide approximately 480 volts at terminals of transformer bank and to design lines for a maximum drop of 8 or 9 percent to the most remote motor for the worst loading conditions assumed.

Load Center

In more recent years another practice has come into use which presents a slightly different problem. This involves the use of small 480-volt generating plants as a source of power for small properties. The problem differs from those associated with the older practice in that it is not always possible to locate the generating plant at the load center. In a recent case it was necessary to utilize a high point on the lease as a site to avoid flood water which covers the lease to a depth of two or three feet during the rainy season. This location does not coincide with the load center, and as a result some of the lines are too long for economical transmission at 480 volts. It is obvious that in such cases, and on leases where wide-spacing practice is followed, a smaller number of wells can be served economically from a single substation or power plant, and cost per well of using electrical energy is thus made needlessly high.

The remedy is to find a way of increasing the distribution voltage without increasing the cost of the apparatus involved. All the electrical manufacturers serving the oil country, stock as standard equipment 550-volt motors, control apparatus, transformers having the necessary voltage taps and generators rated at 600 volts. The price of this equipment is the same as equivalent 440- and 480-volt apparatus and operating characteristics are similar.

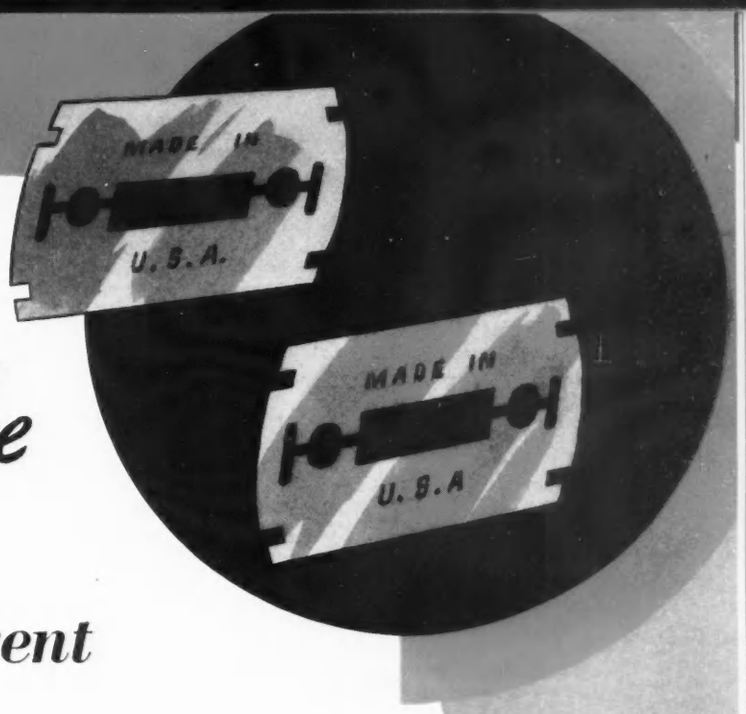
More Volts, Less Wire

The higher the transmission voltage the lighter the lines required to transmit a given amount of energy with a specific loss in transit. The current in the line varies inversely as the voltage, so that when 550-volt equipment is used instead of 440-volt, only 80 percent as much current is transmitted. Voltage loss varies directly as the current and energy loss as the square of the current. In a given network the former will decrease 20 percent and the latter 36 percent as a result of the proposed 25 percent increase in voltage. The capacity of an existing 440-volt system may be increased 25 percent, i.e., 25 percent more motor horsepower may be connected to it, without increasing the line losses after making such a change. As a rule one is concerned with the percent drop in voltage in a line rather than the volts.

A factor frequently overlooked is that in a system in which relatively small conductors are used instead of heavy cables, the material is utilized much more effectively. In order to show this the table accompanying this article was prepared. The formula on which this principle is based may be found in standard textbooks on electrical distribution but is not given here as it is rather cumbersome. In general it may be said that increasing the size of a relatively small wire a certain percent decreases the obstruction (impedance) offered to the passage of a current a greater percent than does the same percent increase in the area of a relatively large wire.

In order to make use of this table in an abstract way it is necessary for one to have in mind the relation existing between the areas of the different sizes of wire tabulated. In the Brown & Sharp standard in common use in America the area of a given size of wire is equal to that of the wire bearing the next larger number multiplied by the cube root of 3. It follows from this that the factor for a difference of 1 size is 1.26, 2 sizes 1.56, 3 sizes 2 and 10 sizes 10. Incidentally if one remembers the size, weight and resistance of any one size of wire he may calculate the area, weight and resistance of any other size by using one or more of these factors.

The relative economy of using copper in what will be designated as large and small conductors in such circuits as are in common use in the oil field may be seen from the following illustrations. Suppose that



They Look alike

But Are Different

ALL pipe of a given type looks alike, it's all made to specifications. But put it to the test of hard use and there's as much difference as there is in razors, motors -- or human beings.

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in a circuit under consideration it is proposed to change from No. 6 to No. 4 wire. An increase of 56 percent in the weight of copper is involved and from the table the impedance per phase of the circuit will change from .738 to .496 or 32.8 percent. If the size of wire in the circuit had been No. 0 and it was proposed to change it two sizes to No. 000 the increase in weight would again be 56 percent but the decrease in impedance when calculated in a similar manner will be only 14.7 percent. Obviously copper in large cables may be used less effectively and costs more per pound when so used. Other items reduced as a result of using the lighter conductors are labor, lighter poles, hardware, freight and local transportation. In addition to these factors wires of small cross section possess a greater breaking stress.

Impedence per phase per 1000 feet of 3-phase circuit mounted on 4-pin cross arms.

Size	Imp.	Imp. .64	Size	Imp.	Imp. .64
No. 6	.738	1.153	No. 1	.312	.487
No. 5	.599	.936	No. 0	.286	.448
No. 4	.496	.775	No. 00	.251	.392
No. 3	.518	.653	No. 000	.232	.363
No. 2	.353	.551	No. 0000	.220	.344

The three factors to be considered in designing lines of this type are voltage drop, energy lost in transit and mechanical strength. As a rule if ample care is exercised in making provisions for the first the second will be found to be within the limits of good practice. The relation existing between the impedance of 480- and 600-volt lines designed with the same liberality is as follows:

Assume that the current in a 480-volt line is 100 amperes and that it is designed for a 40-volt drop for the worst load conditions assumed. The current in a 600-volt line carrying the same amount of energy will be 80 amperes and the corresponding drop will be 50 volts. Let I_1 and I_2 be the impedances per phase of the two lines respectively.

$$(A) \quad I_1 \times 100 : I_2 \times 80 :: 40 : 50$$

Simplyfying equation (A)

$$(B) \quad I_1 : I_2 :: 64 : 100$$

It may be seen from Equation (B) and the table that in a 480-volt circuit designed for use of No. 4 wire it is possible to substitute No. 6 by raising the pressure to 600 volts, since the impedance (.496) may be increased to .496 divided by .64 or .775, a quantity somewhat greater than the impedance of No. 6. In like manner it may be shown that No. 2 circuits may be changed to No. 4 and No. 0000 to No. 1. In each case the sizes substituted are more liberal than the ones proposed for use on the 480-volt lines. The first two changes involve a saving of 35.9 percent of the copper and the third 60 percent. From the standpoint of existing 480-volt lines it may be shown that a given load may be transmitted 56¼ percent farther without altering the energy lost or changing the percent voltage drop.

Interchangeability of Apparatus

From the standpoint of the oil company the worst feature is the matter of the interchangeability of 440- and 550-volt apparatus. As far as insulation is concerned both types are subjected to a test of twice normal voltage plus 1000 volts before they leave the factory. One major manufacturer and probably others uses identical insulation on motors rated for 440 and 550 volts. Since the rating of such motors is approximately proportional to the square of the voltage, 550-volt motors will have about 65 percent normal rating when connected to a 440-volt system. The 440-volt motor may be operated with safety from a 550-volt circuit but due to the fact that it will take an abnormal exciting current it will not be able to carry normal rating without overheating. Such motors may be installed at the most remote wells on the system where voltages are likely to be low. In like manner 550-volt motors may be used at loads near plant or substation on a 440-system where voltages will be high. In actual practice it is nothing unusual to see 440-volt motors operate at 500 volts for long periods.

Double- and triple-rated single-speed 440-volt motors may be utilized effectively on 550-volt circuits. The intermediate and low rating connections are merely devices for decreasing the voltage over groups of coils of the stator windings. In the intermediate connection about 80 percent full line voltage is impressed over a given group. If 550 volts is impressed over the intermediate connection the voltage over the group will be 440, so the motor will be able to carry its maximum rating. By a like process of reasoning it may be seen that the second rating of a double-rated and the third of a triple-rated motor will have a rating equivalent to one half its high rating on 440 volts. The proportion showing this is as follows:

$$(550 \div \sqrt{3})^2 : 440^2 :: \text{Unknown rating} : 100\%$$

Solving, Unknown Rating = 52%

The capacity on each connection of 550-volt triple- and double-rated motors when operated on 440 volts will be 65 percent of their respective nominal ratings.

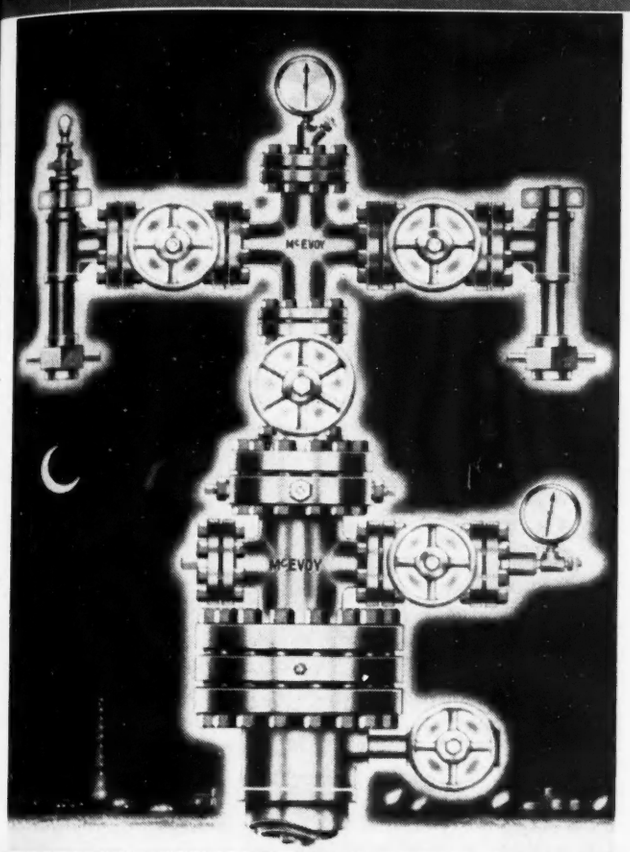
Control Equipment

As far as control equipment is concerned it is interchangeable, provided the hold-in coils of the line switches correspond to the voltage in use. Of course, cutout fuses and thermal relay heating elements must be such that they will protect the equipment for the currents involved. These features represent only a minor investment.

It does not appear that the increase to 550 volts increases the personal hazard to the workmen operating a property. There is no occasion where it is necessary for operators to touch live parts on either voltage and if this is done they subject themselves to an unnecessary danger. Both voltages are dangerous to a man with a weak heart or to any man who allows himself to get across a circuit in such a manner that he will not be freed automatically. To the writer, discussing the comparative dangers of the two voltages, it is considered similar to trying to decide which is the more hazardous, being shot with a 38- or a 44-caliber rifle.

The only objection to the inauguration of the practice of using 550-volt equipment not mentioned above is that of the matter of manufacturer's stocks. The fewer standards in use the easier it is to serve the trade. Historically voltage standards have gone through a number of changes. Starting with 120 volts it was increased to the 250 range and then settled down to the present, 440 volts. It appears that the change in conditions justifies an increase to a higher voltage, and the establishment of another historical landmark in the use of electric power for pumping widely spaced wells.

AT the TOP..... McEvoy saves you money



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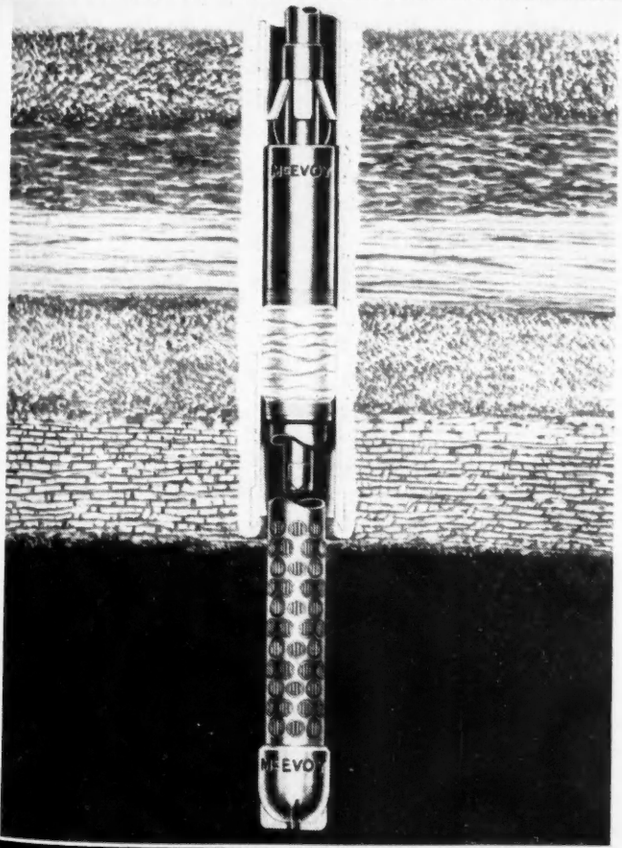
3. Each tree designed to fit specific conditions found on your well.
4. Permits completion of your well in your accustomed way.

AT the BOTTOM McEvoy saves you money



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2. Knurled Screen gives greatest inlet area and long life.
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4. Entire Bottom of Hole unit works smoothly with McEvoy Top of Hole Equipment.

★ GET YOUR OIL INTO YOUR TANKS PROMPTLY

★ REDUCE COSTLY SHUT-DOWN TIME

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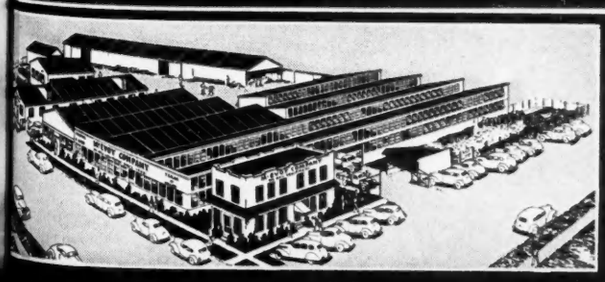

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Pipe Line Suspended Across Corrosive Area

SUSPENSION of a pipe line above ground offers a complete and practical solution to all types of soil corrosion problems. In addition this method of construction also places the line in immediately accessible position for prompt repairs in areas which normally accord considerable interference with such work.

The pipe line department of Sinclair-Wyoming Oil Company has successfully applied the suspension method of construction on nearly a mile of the company's main crude oil carrier from the Salt Creek field to its Parco, Wyoming, refinery. The new method has completed a successful test over a period of months which include a considerable range of temperatures, and has been pronounced successful by company officials.

This method is particularly important from a cost viewpoint when used over long stretches. The materials used in the construction, which was done entirely by regular members of the pipe line crew of the company, were almost entirely salvaged materials from the company's scrap heap.

Construction details of the project show a total of 104 stands, constructed of junked 4-inch pipe, bent by the wrinkle bend method into a horse shoe shape and welded into bases cut from salvaged sections of regular 8-inch line pipe, to form loops some 3½ feet in height. This arch was placed upright on the ground and a section of ⅜-inch chain welded to the center of the arch. The chain was the only piece of new material used on the entire project.

Four-inch pipe, bent to form an arch and welded into a base of 8-inch pipe constitutes the supporting stand. Slings made from sucker rods and suspended by a ⅜-inch steel chain welded to the supporting arch carry the weight of the line.

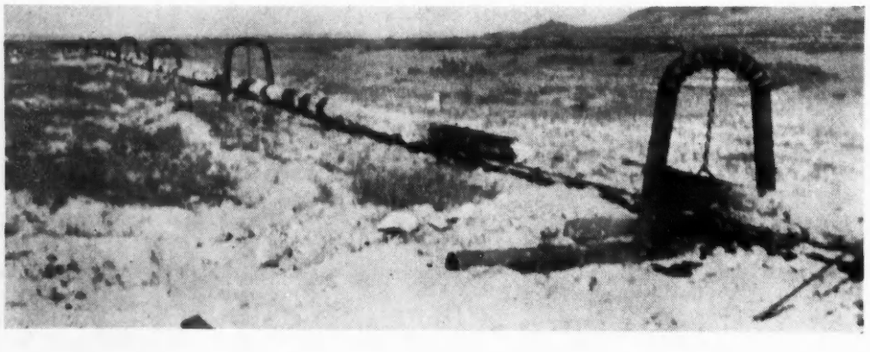
Loops made of discarded sucker rod were then welded around the main crude pipe to form slings by which the line was suspended beneath the supporting arch. By this method the line was swung about one foot above the ground level for a distance of 4160 feet by placing the stands at 40-foot intervals. Using this suspension method, the line has been placed completely clear of the ground for a stretch of nearly a mile over a swampy section of highly corrosive soil which heretofore has formed an important problem for the pipe line department of the Sinclair firm.

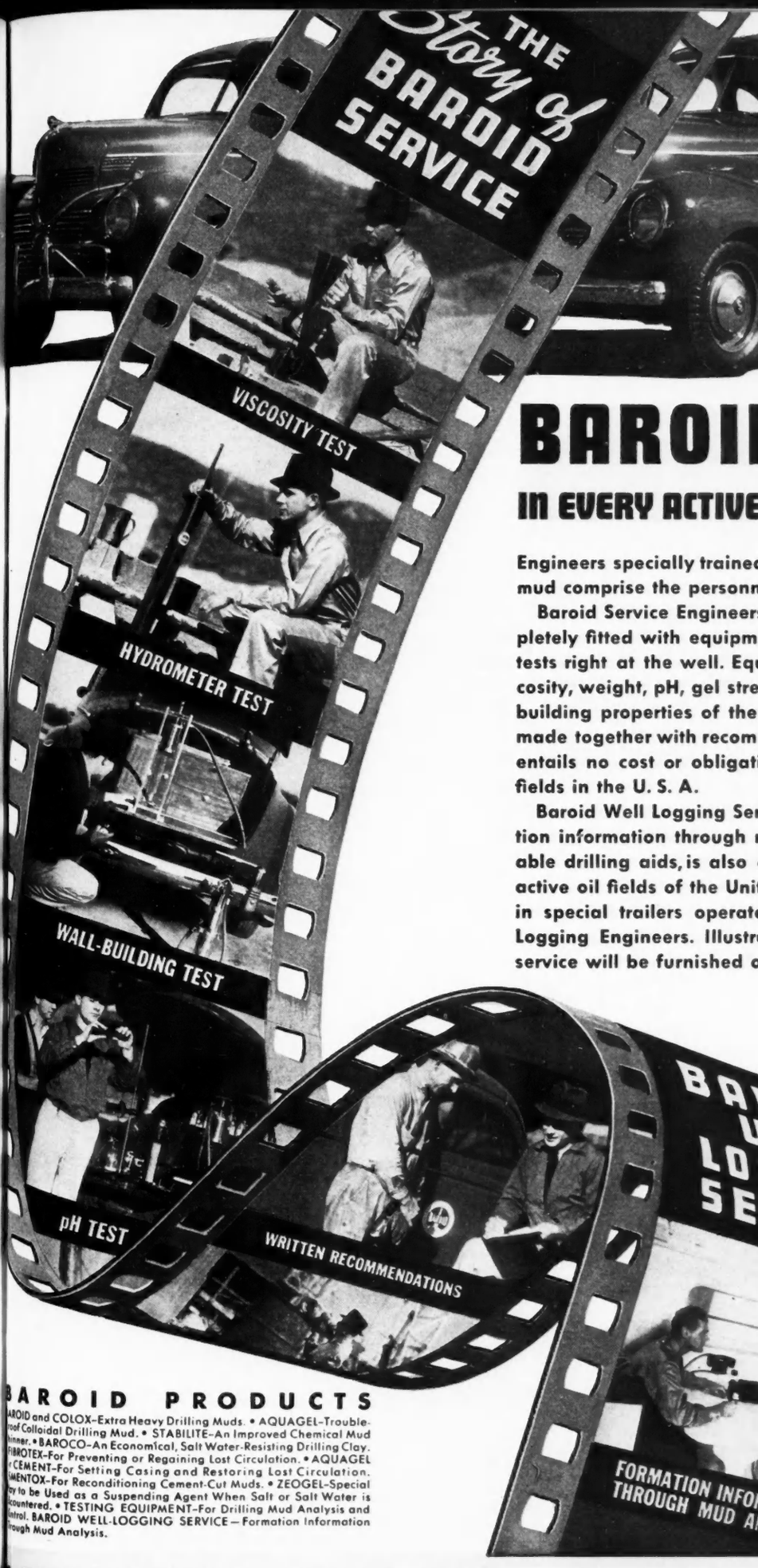
Following its suspension from the arches across this territory, the line has been coated with the regular asphalt-paper covering to protect the pipe from rust and atmospheric interference.

The soil in the area contains heavy concentrates of alkalies and salts, both extremely active agents which result in extensive damage to pipe laid in the ground. In addition to this problem the area so affected is extremely swampy, making the line nearly inaccessible to repair crews during the spring and early summer season of the year; while swarms of mosquitoes make work in the vicinity nearly an impossibility during late summer and early fall periods. Extensive work on this section of the line was formerly, in fact, nearly entirely confined to fall periods after a killing frost had eliminated the mosquitoes, or to early spring before thaws softened the ground too much to permit easy transport of materials. The portion of the line so handled is adjacent to Sinclair-Wyoming's No. 8 pumping station about 50 miles southwest of Casper, Wyoming.

Close check has been kept on the exposed portion of the line to determine the effect on its operation of being exposed to temperature extremes which may vary from 110° F. in the summer to —40° F. or below in the winter. Operation to date has been completely successful.

White, alkaline soils, extremely corrosive to pipe, are plainly evident in this view. Placed 40 feet apart, 104 stands support 4160 feet of 8-inch oil line above the ground.





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Baroid Well Logging Service, which gives the operator "formation information through mud analysis" as well as other valuable drilling aids, is also available to drilling companies in all active oil fields of the United States. The equipment is mounted in special trailers operated by specially trained Baroid Well Logging Engineers. Illustrated literature and cost data on this service will be furnished on request.

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New Type Muffler Solves Exhaust Problem in Congested Areas

SUPPRESSION of pipe-line engine exhausts, of little import when the station is set in wide-open spaces, becomes imperative when the site falls within the limits of an incorporated political unit or when lease limitations group company houses and the station on a small plot.

The usual elevated type of exhaust, in such settings, also introduces a possible cause for trouble with the neighbors in the relatively small amount of water carried out with the gases; this being either in the form of steam or fine droplets. In the latter case the drops frequently carry oil and rust particles, and color buildings, or seriously mar the snowy whiteness of nearby housewives' Monday laundry.

One company has developed a type of muffler which effectively solves the noise problem, requires no elevated structure or guy ropes, and prevents spraying of oil or water. The exhaust line is carried underground from the station building through the usual covered pit, to allow inspection or repair, and terminates in a shallow concrete pit, set somewhat lower than the incoming pipe, so as to allow a sump and drain for removal of condensate.

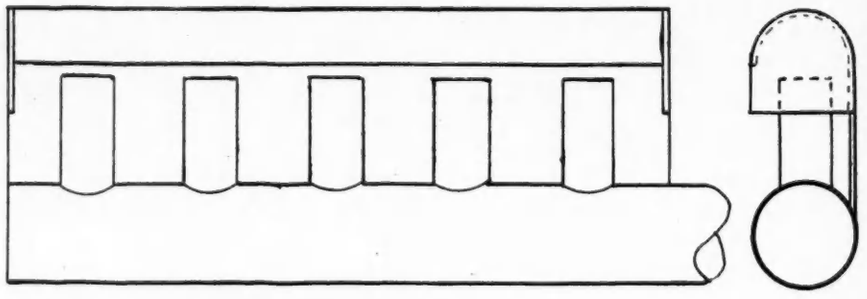
To handle the exhaust from 300-horsepower horizontal gas engines operating at relatively slow speeds, an 8-inch line suffices without imposing unduly high gas velocities or creating serious back pressures.

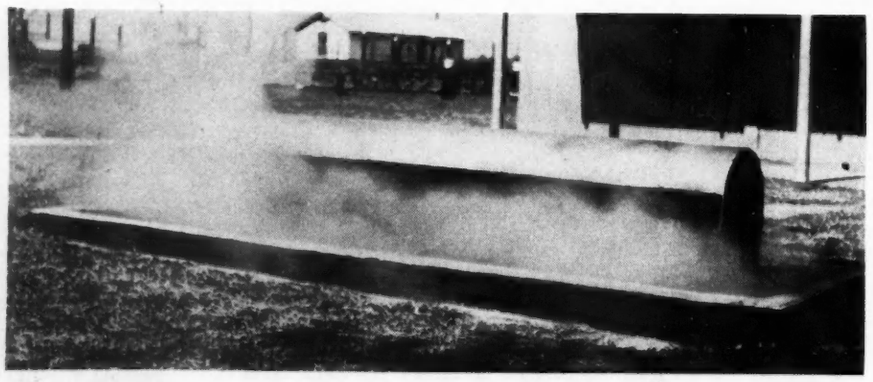
The outer end of the pipe is blanked off with a section of flat plate, and into the upper surface of the line are set a number of 4-inch risers, of any convenient height, but not shorter than the diameter of the exhaust main. These risers, affording more area for gas passage than the main, tend to slow down the impulse waves, a portion of each impulse being vented by each riser in turn, any residual pulsation being reflected by the flat end plate and again running the gauntlet of the open risers to face complete escape in the face of the next oncoming wave of exhaust gas.

Over the tops of these risers is set a curved hood — conveniently made from a longitudinally-split section of pipe at least as large as the exhaust main—supported along one side by a strip of tank plate long enough to carry the hood beyond the end risers by a distance at least equal to half that separating the individual vent pipes.

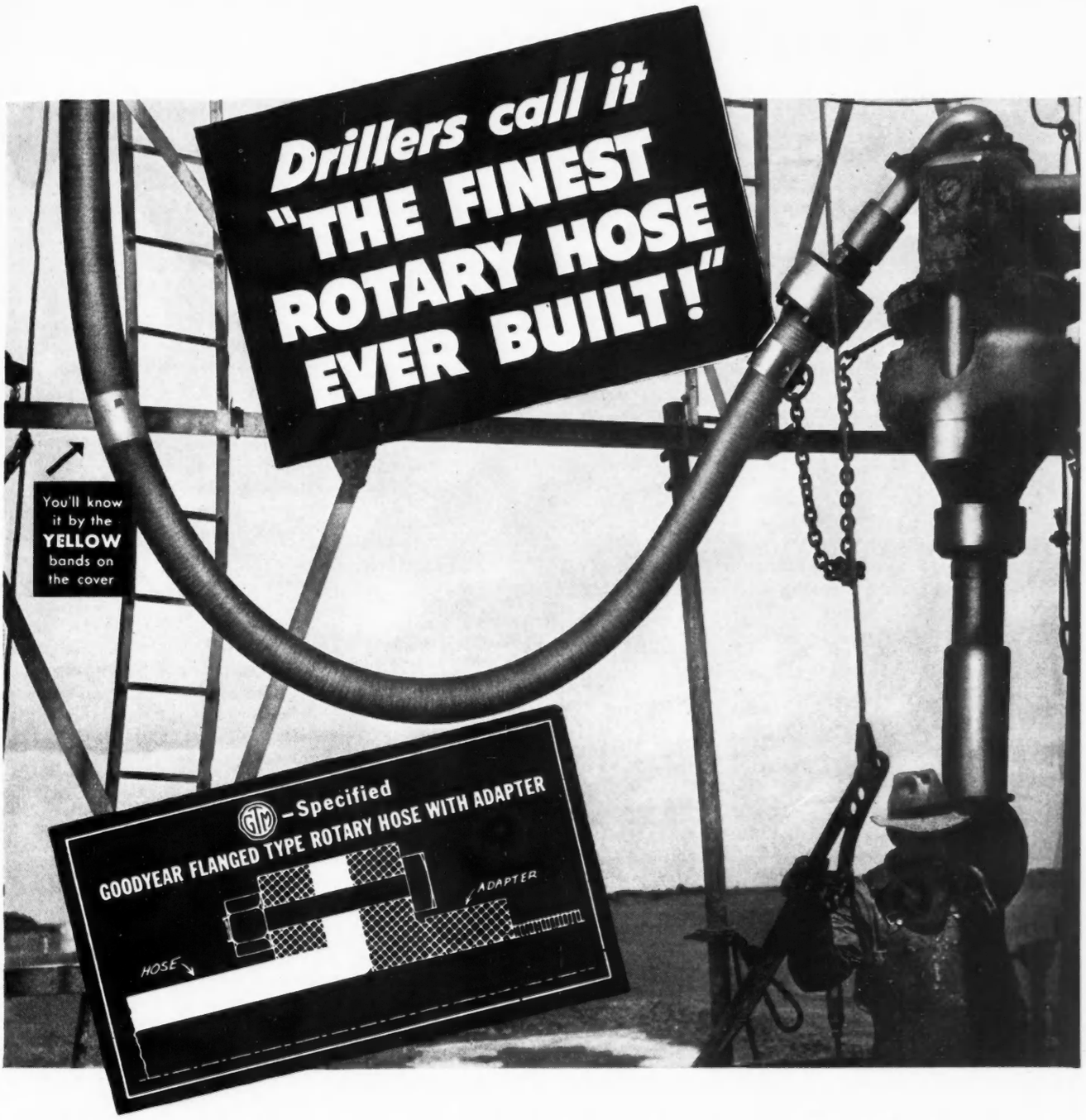
With the outer edge of the hood just above the tops of the risers, and the ends of the curved section cut off with plates extending down below the vent line, the exhaust impulse is trapped within the hood and split to travel both ways under the shield, and finally vented to free air in a downward direction by the only free edge of the cover. This downward flowing exhaust carries with it any condensation deposited on the curved top, allowing it to collect in the sump and be disposed of by conveniently located drains.

When dissipated through a muffler of this type, the sharp "bark" of the exhaust from a 16-inch cylinder is little if any louder than the sound produced by striking the end of an empty oil drum a light blow with the fist; while the only moisture escaping the device is in the form of a floating mist without force.





Side and end view of diffusion type muffler, showing spacing and hooding exhaust tubes. At left is view of muffler in concrete pit which traps and drains away condensation. This muffler saves power by minimizing back pressure while effectively damping out the successive exhaust impulses.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GOODYEAR FLANGED TYPE ROTARY HOSE WITH ADAPTER
ADAPTER
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Easier to handle—due to appreciable weight reduction at ends.

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These exclusive features, combined with Goodyear's time-proved wire-reenforced carcass construction, make this new flanged-end hose a marvel of efficiency, dependability and performance. Let the G.T.M.—Goodyear Technical Man—give you the full story. To bring him to your rig, write Goodyear, Akron, Ohio, or Los Angeles, California—or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

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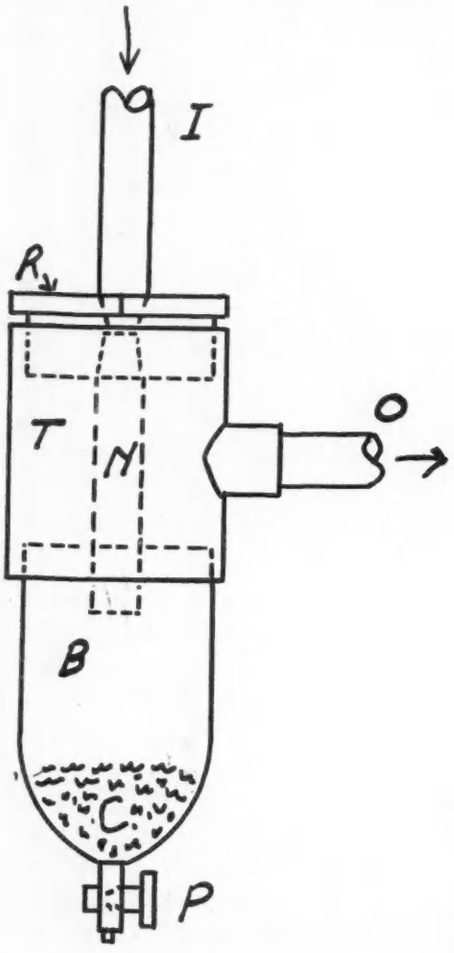
Fluid Traps Overcome Gas Engine Trouble

At irregular intervals a battery of four-cylinder, vertical gas engines on main-line pumping service, and consequently considered as under fairly uniform or at least but slowly shifting load characteristics, would suddenly begin firing erratically, knocking viciously, emitting dense black smoke from the exhausts, and in the majority of cases causing the lower end of the porcelains of the spark plugs to crack through close to the shell, allowing the high tension current to short out—even shutting the engines down until new plugs could be supplied.

The plug breakage was first regarded as the cause behind the entire trouble, and various types of plugs were tried in an unsuccessful attempt to find some design which would stand up. But, when no plugs seemed to give markedly better results than those furnished by the engine builder, that type was again used, and each engine shut down as soon as the knocking began. Examination then showed the plugs to be intact, eliminating them as source of the trouble.



(Not drawn to scale)

I -- Gas inlet

R -- 4 x 2" bushing

T -- 4x2x4" tee

N -- Nipple

B -- Bull plug

P -- Petcock

C -- Copper shavings

O -- Gas outlet

Governors were checked in the usual routine, but were hardly suspected as the difficulty would sometimes seem most severe at one unit of the battery of engines, at other times on an entirely different unit. Checking of the manifestations eventually proved that the end unit—farthest from the incoming gas supply—was most frequently hit; while a comparison of the times of such disturbances was found to coincide with or closely follow a sharp temperature drop.

Trouble in Fuel Supply

Those factors pointed toward trouble with the fuel supply; natural gas, drawn from a nearby high-pressure distribution main supplying fuel without complaint to many industrial and domestic consumers on both sides of the pump station.

Frequent sampling of the incoming gas showed no more than the merest trace of moisture, while continuous records of gas pressure checked the slight variations as well within the capacity of the individual regulators incorporated in each incoming fuel line.

On the hypothesis that the sudden cooling of the gas might be in some manner responsible for the trouble, the incoming line to No. 1 unit was enclosed with a wooden trough for a distance of six feet just before the last turn in the line entering the mixing valve. When this line was suddenly cooled by being surrounded through this section with a mixture of crushed ice and salt, the engine would invariably respond with the same symptoms as those of the earlier trouble.

The difficulty was thus traced to condensation of extremely high-test gasoline from the gas, this liquid fuel being picked up in slugs by the inrushing stream of gas and air and carried into the engine cylinders. Detonated there, it gave the characteristic knock and, through lack of sufficient air, was but imperfectly burned and thus caused the heavy black smoke.

Experimental Trap

An experimental combination expansion chamber and liquid trap was built in the station and the intake to No. 1 unit changed to include it. A clean 4-inch cast iron Tee, "T" of the sketch, having a 2-inch side outlet, was selected, the

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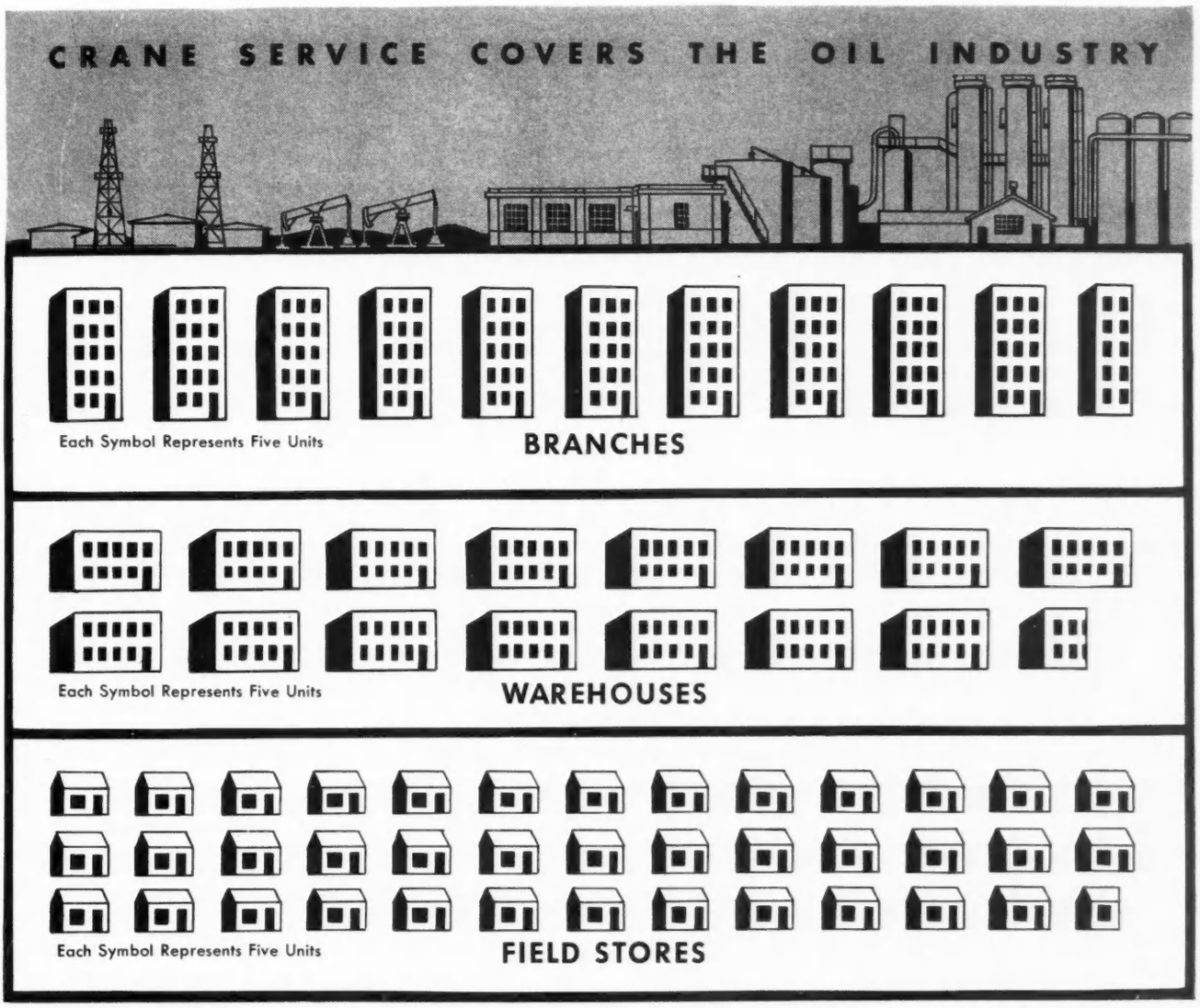

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bottom being closed with a 4-inch bull plug "B" which had been drilled and tapped at the tip to take a ¼-inch petcock.

Into the upper opening of the Tee was screwed a 4 x 2-inch bushing, "R." Before being made up into the Tee, the 2-inch taper thread in this bushing was retapped from the bottom so as to leave two equal tapered threads meeting at the center of the bushing. Then a nipple "N" was screwed into the lower portion of the bushing thread, being cut long enough to project an inch below the bottom of the Tee and thus well into the hollow space within the bull plug. With the inlet line screwed into the top of the bushing, to bottom firmly against the nipple within, and the outlet line to the mixing valve connected to the side outlet of the Tee, the device was connected and tried out while the chilling trough was still in place.

Erratic Firing Controlled

Although gasoline was still being formed, the erratic firing of the engine was controlled, save in those cases where draining of the collecting bowl of the plug was intentionally delayed too long.

To provide some economical and effective method of dampening surges within the tiny pool of liquid and prevent it being retaken into the fuel stream, a wad of copper shavings—obtained from the nearest 5-and-10 store in the guise of a dishpan scourer or "kitchen aid"—was slightly flattened and placed inside the plug.

This copper pad not only formed an effective fluid shield, but also was found to trap a surprisingly large amount of tarry material having a noticeably gritty feeling—all of which foreign matter must formerly have been carried into the engine to add to the formation of an abrasive carbon matrix and to accelerate ring and cylinder wear.

The pad was easily removed when the engine was down, simply by unscrewing the bull plug, when it could be washed with gasoline, dried, and replaced.

Since the installation of these expansion chambers and fluid traps on all intake lines the station has experienced no return of the former trouble, and the carbon removed from the ring grooves at overhaul time is of a much softer, flakier nature than before, with marked reduction in ring and liner wear.

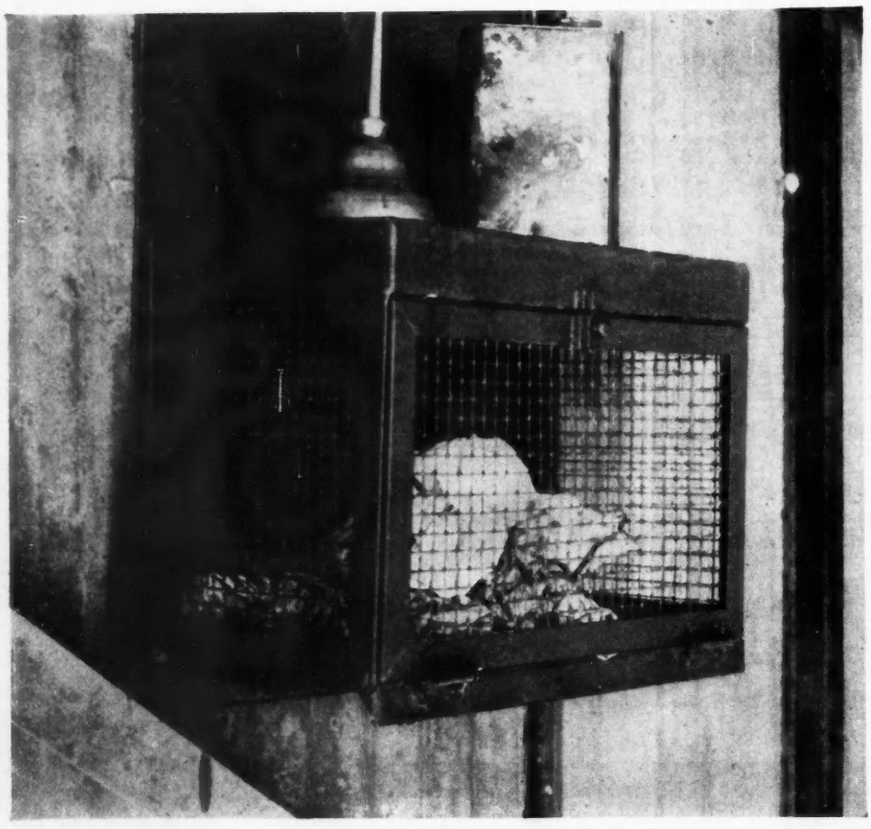
Receptacle Eliminates Fire Hazard

THE ever-present hazard of fire around a pumping well has to be continually guarded against. This is particularly true on wells equipped with the familiar belt hall and engine room where greasy and oily wiping rags are likely to accumulate in out-of-the-way corners. Spontaneous combustion will be almost sure to follow if they are allowed to remain there, especially if poor air ventilation and a warm temperature happen to occur at the same time.

Foreseeing such possibilities, a large company on the West Coast has installed a light metal cage, screened on three sides, in the engine room or belt hall of each of their wells, for the purpose of temporarily disposing of dirty rags and waste. As shown in the accompanying photograph, the front of the cage is opened against the pressure of two spring hinges, so that the door will always remain closed and latched when not in use.

The dimensions of this cage are approximately 17 inches long, 10 inches wide and 12 inches high. The hardware cloth sides and light angle-iron corners are welded together to form a sturdy enclosure. The top and bottom are each made of a single piece of light sheet metal, the former acting as a convenient shelf on which the pumper can set his oil cans and tools while servicing the equipment.

When welded or securely fastened to a metal or wood backboard as shown in the photograph, this practical safeguard can be bolted to the wall at any convenient place close to the pumper's routine line of travel.



This cage makes oily rags safe

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Slush pump relief, most operators agree, is the toughest valve job around a drilling rig, yet a Cameron 2" Flex-Seal Mud Valve on pump relief service in the Old Ocean Field, Brazoria County, Texas, drilled five, 10,250' wells. Upon completion of the fifth well, total repair cost on this valve was $6.70, an average of $1.34 per well! Competitive type valves in the same service on two other rigs in this field averaged one well each, requiring repairs approximating $22.00 per well.

5 GOOD REASONS WHY:

1. Inexpensive renewable resilient flow-way insert absorbs cutting action of abrasive-laden fluid and seals two-piece valve body.
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First Aid Is Important in the Safety Program

By WILLIAM R. PAUL

BEFORE any safety program has gone very far, it is very likely that the one responsible for its success will begin to think about first aid, and how he can introduce it to his men in the simplest possible manner. He will realize that first aid, properly introduced and taught, will not only give the men something concrete to do when an accident occurs, but will also aid in reducing accident frequency by bringing to their attention such things as broken limbs, asphyxiation cases, and possible complications of minor injuries.

The small operator, worried over his high accident frequency, need have no fear of presenting a first-aid program to his men. It certainly does not take a doctor to teach first aid in its simplest forms, for if it were necessary to have a trained man to handle all cases, then there would be no need for the simple instructions concerning care of a patient now given in industry generally.

First aid, properly administered, will aid in making the victim of an accident more comfortable; it will reduce the possibility of later complications due to lack of immediate care; and will lessen the chance to injure the patient still further in moving him to a hospital or other place where surgical attention is available. In other cases, such as drowning or asphyxiation, first aid may actually save the life of the victim.

The oil industry, and especially the development and production divisions, have special need of men trained in first aid, because much of the work is carried on in places where immediate medical care is impossible, and the patient must be treated at once, or be carefully moved where he can be taken care of. It is a part of the safety work that no operator, no matter what his size, can afford to pass up.

Government Manual

The Bureau of Mines has published a manual of instruction that is one of the best available on the subject. It can be had from the Superintendent of Documents at Washington, at nominal cost. It would be a wise investment on which the operator could hardly go wrong if he would furnish each of his men with a copy of this manual.

As to what should be taught in the way of first aid, there are several answers to this question. It would be much better to be well informed on a few methods of treatment than be only partially informed on a good many. So the best progress can be made by moving slowly, but thoroughly, from the simplest to the more complex.

Possibly one of the most important treatments for an oil worker to learn is artificial respiration. It is a tricky procedure because it looks so easy, yet is somewhat difficult.

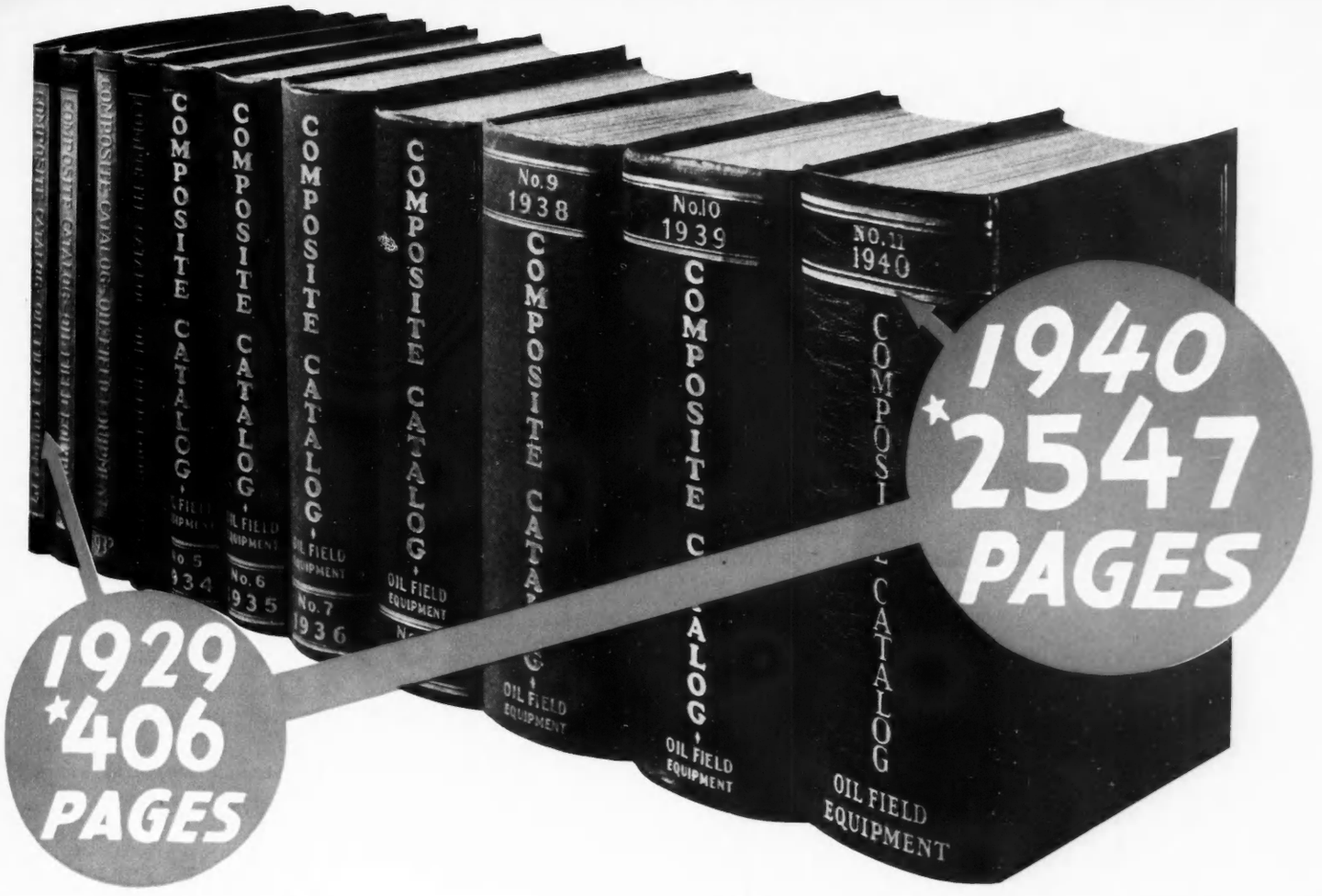
Another important feature of first-aid work is in the handling of fractures. Frequently the injured man is far from medical care and must be moved many miles before a doctor can be found to set the injured member. If proper care is not taken in moving, a simple fracture which could be set easily and without permanent injury, may become a compound fracture requiring a long period of hospitalization and care. This is expensive for the employer as well as tragic for the employe, when it is considered that a little care could have prevented the complications. So stress should be placed on splints and how to use them. If no other instructor can be found at first, the company doctor should be called in for aid. However, due to his technical knowledge and advanced bandaging experience, he may scare the men clear out of ever trying, and that would certainly not be to the best interests of the program.

Knowledge of pressure points has saved many a man's life, and it is becoming more and more frequent to pick up the morning paper and read where some passing motorist has held the flow of blood from a wound merely by applying pressure at the right spot on the injured's circulatory system. So it is necessary that a properly-trained first-aid man know the pressure points on the body, and how to make and apply an improvised tourniquet in a case of severe bleeding. Emphasis should always be placed on using the materials that can be found most anywhere. Regular bandages, splints, stretchers and other safety equipment are all right and work fine if available, but accidents have a habit of happening when the ready-made things are not at hand, and for that reason, all practice sessions should include the use of hastily-gathered materials. Examples are belts for slings; coats for stretchers; and sticks out of the bottom of a curtain for minor splints. With practice and a little contest among those present, a surprising amount of ingenuity will present itself.

There are many important and interesting things to be developed in a first-aid program such as treatment of burns, poisons, sprains, sunstroke, snake bites, and shock.

The operator who wishes to get the most from his safety and first aid program will plan to have his regular safety meetings, with some time set aside for first aid discussion, and if possible, will hold extra practice sessions for bandaging and artificial respiration.

First-aid work must go hand in hand with the accident prevention program, and should never be presented alone for the mere purpose of teaching individuals to doctor other individuals in case of emergency. It should serve to emphasize the need for safety in the first place so first aid will not be needed in the second place.



Pictured above is each of the eleven issues of The Composite Catalog from the 406-page 1929 Edition to the 2547-page 1940 Edition.

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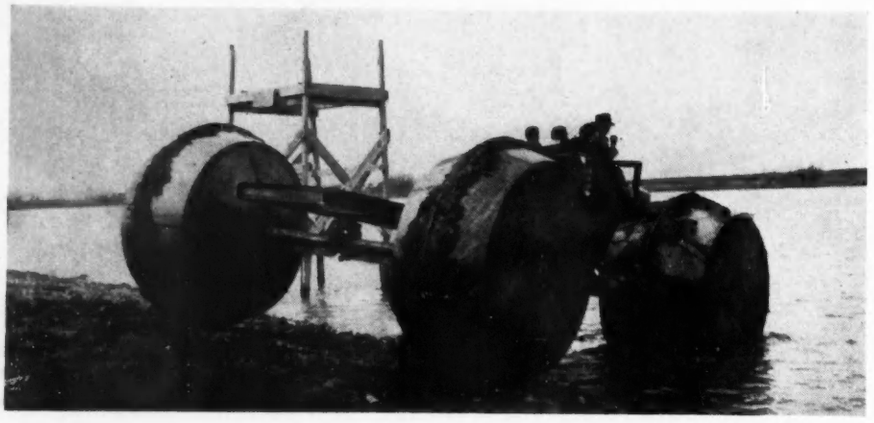
THE COMPOSITE CATALOG

Swamp Buggy Makes Trial Run in Oklahoma

A NEW swamp buggy, made in the Tulsa machine shop of Stanolind Oil & Gas Company, was approved following its initial trial on a lake east of town. The machine, after drilling equipment and other requirements are mounted on the frame, is to be sent to the Gulf Coast where it will be used by the exploration department in geophysical work. After completing the series of short runs in and out of water, the machine was returned to the shop for final touches and mounting of machinery. Another buggy is under construction in Texas, designed to carry detection equipment for geophysical work, while the one fabricated at Tulsa will carry drilling tools.



Wheels for the machine are welded of steel plate, and are 4 feet wide by 9 feet in height. This volume gives a great degree of buoyancy for they are air-tight, with plugs provided for checking. Rear wheels are used to steer when on land, this being accomplished by 3/8-inch cable controls. In the water, the machine is manuevered by the front wheels which furnish the driving power whether on land or in water. By applying power to one driver and holding the other steady, the machine may be turned as desired.

Clearance of the vehicle on earth is about 4 feet. As mentioned, the two front wheels furnish the driving power, these being chain driven. A double breaking system is employed. Power is furnished by a 95 horsepower, gasoline engine of the automotive "V" type. In all the machine is 21 feet long.

The motive power is delivered to the wheels through two transmissions which give the operator 24 speeds forward or 8 reverse. At no speed or pull attempted during the test was any difficulty experienced.

The pictures, from top to bottom, show successively the size of the wheels, the machine entering, in, and leaving the water. R. W. Stuart, of Stanolind Oil & Gas Company's exploration department, is shown in the top picture.

A. I. M. E. Economics Session Debates on Federal Control

By WM. V. GROSS, Associate Editor

A STRONG undercurrent of antagonism to anything suggestive of federal control of the oil business was evident in papers and discussion in the annual meeting of the economics section of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers in New York February 15.

On several occasions the meeting, supposed to be strictly of an economic and technological nature, would have, with a little shoving or encouragement, developed into one devoted to politics or policies, but in each instance Lyon Terry of Chase National Bank, New York, or S. A. Swensrud, Standard Oil Company of Ohio, Cleveland, the morning and afternoon chairmen, respectively, called the conversation back to charted courses.

Speakers came from both sides of the fence, the government and private enterprise, with the lattter doing most of the questioning in discussions following presentatioin of the papers.

Abstracts of the papers and a few highlights of the discussions follow:

The Place of the Oil Industry in the National Economy

By JOHN D. GILL and E. T. KNIGHT
The Atlantic Refining Company, Philadelphia.

The petroleum industry has played a big role in effecting an increase in the material welfare of the people. In a quantitative sense it is rendering through its peculiar and highly advanced techniques a prodigious volume of physical service. And, contrary to the notions of some of its critics, it is enjoying a relatively modest share of the national income.

Total weight of merchandise of all classes consumed annually in the country approximates 1925 million tons. Of this petroleum represents about 10 percent. But the place of the oil industry in the economy as measured by the industry's share in the national income amounts to somewhat less than 2½ percent, or scarcely more than 3 percent, depending on the definition of "industry."

For its size the petroleum industry has been contributing more rapidly to the growth of the standard of living than the manufacturing industries collectively. Between 1923 and 1937 the industry more than doubled its service, while its share of the national income increased only 41 percent. It is by such achievements that the standard of living is raised.

The authors presented five tables in the text and six pages of tabular data in the appendix to bear out conclusions arrived at in the paper.

World Consumption of Petroleum and Related Fuels During 1939

By V. R. GARFIAS, R. V. WHETSEL AND J. W. RISTORI
Cities Service Company

World consumption of petroleum and related fuels for civil purposes in 1939 was close to 2,024,000,000 barrels or approximately 110,000,000 barrels more than in 1938, the United States accounting for 96,000,000 barrels of the increased amount.

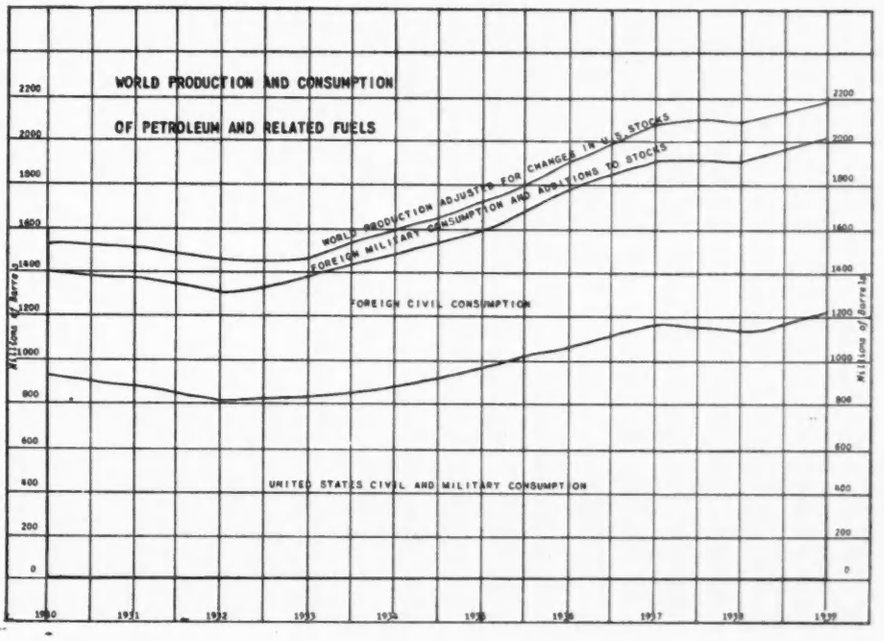
It should be noted that with the annexation of Czechoslovakia and part of Poland, civil consumption in Germany during 1939, notwithstanding severe rationing in the last four months of the year, was 54,000,000 barrels or only 1,600,000 barrels less than in 1938 and that domestic production of petroleum and related fuels was some 34,000,000 barrels short of civil consumption. The mounting petroleum requirements of the military forces of greater Germany are of course not included in these figures of civil consumption. To supply this deficiency Germany now must rely almost exclusively on the Rumanian fields, which in 1939 produced about 35,000,000 barrels in excess of the Rumanian civil consumption. However, these fields are supplying and have supplied for years the oil requirements of the neighboring Balkan States and part of the Italian needs thus reducing the balance available to Germany.

Should Italy go to war as an ally of Germany the available Rumanian supply would be insufficient to take care of the requirements of Germany and Italy even assuming that the Balkan States were entirely deprived of their oil requirements. These conditions seem to assure the continued neutrality of Italy as long as that country is not assured—while at war—of its needed civil and military oil supply from other sources than Rumania—a condition which practically would mean the effective control of the Iraq fields and the Eastern Mediterranean by the axis powers. The accompanying chart shows that foreign military consumption, and possibly additions to foreign stocks, aggregated 168,000,000 in 1939, or 11,000,000 barrels more than in the preceding year.

The effect of the four months old European war has been to decrease the civil consumption in the belligerent countries and to increase it in the neighboring neutrals. The tables show that the civil consumption in the United Kingdom, France and Germany has decreased some 7,400,000 barrels while civil consumption in Italy, Netherlands, Sweden, Norway, Denmark and Belgium has increased in the aggregate close to 4,000,000 barrels.

Discussion

Questions following presentation of the paper on world consumption of petroleum and related products, which was read by Ristori, brought out that Germany would need from 90 to 100



million barrels of oil per year if the western front campaign were to assume the proportion of military activity which characterized the Nazi invasion of Poland.

Ristori announced the paper on "Tank Steamer Transportation of Petroleum," which was to have been presented, would not be completed until after the return of Valentin Garfias from Mexico. He said he thought new tankers were being constructed at a rate that just about allowed them to replace those sunk in the war but that the rate of launching was not sufficiently rapid to permit any appreciable increase in aggregate tanker tonnage.

World Petroleum Balance Sheet
(Thousands of Barrels)

	World Production of Petroleum and Related Fuels	World Civil and U. S. Military Consumption	EXCESS PRODUCTION OVER CONSUMPTION			UNITED STATES		Foreign Military Consumption and Additions to Stocks
			United States	Foreign	World Total	Excess Exports . Over Imports	To Stocks	
1932	1,362,039	1,348,407	R13,011	26,643	13,632	28,781	R41,792	55,424
1933	1,467,128	1,406,923	67,427	R7,222	60,205	60,254	7,173	53,032
1934	1,562,834	1,507,599	26,164	29,071	55,235	64,013	R37,849	93,084
1935	1,702,793	1,614,475	53,027	35,291	88,318	75,474	R22,447	110,765
1936	1,864,997	1,795,560	52,209	17,228	69,437	74,890	R22,681	92,118
1937	2,121,337	1,914,856	161,445	45,036	206,481	115,677	45,768	160,713
1938	2,062,090	1,914,007	130,343	17,740	148,083	139,420	R9,077	157,160
1939	2,149,700	2,023,883	88,000	37,817	125,817	130,000	R42,000	167,817

World Consumption of Petroleum and Related Fuels
(Thousands of Barrels)

1939

	Motor Fuel	Kerosene	Gas and Fuel Oil	Lubricants	Miscellaneous	Total
United States	554,000	60,000	455,000	24,500	139,500	1,233,000
Russia	28,000	44,000	67,000	9,600	22,000	170,600
United Kingdom	46,800	7,000	29,900	2,900	4,400	91,000
Germany	24,200	800	18,100	3,800	7,100	54,000
Canada	24,000	700	17,000	4,100	5,000	50,800
France	24,800	1,700	16,900	2,200	4,400	50,000
Argentina	7,600	1,300	17,500	550	1,900	28,850
Japan	8,000	1,500	12,000	1,800	2,100	25,400
Netherlands West Indies	270	55	17,500	55	5,300	23,180
Italy	5,700	1,000	12,200	1,000	1,900	21,800
Mexico	3,500	800	12,700	200	1,400	18,600
British India	2,700	7,200	4,200	1,000	1,400	16,500
Rumania	1,100	1,250	10,500	230	1,900	14,980
Australia	7,900	1,300	3,900	500	1,150	14,750
Netherlands	3,900	2,100	4,100	500	1,200	11,800
Netherlands East Indies	1,500	2,000	6,200	250	1,500	11,450
Iran	650	1,300	6,000	450	2,700	11,100
Sweden	4,800	900	3,700	450	800	10,650
Venezuela	1,150	40	8,000	40	300	9,530
Brazil	2,900	900	4,500	280	150	8,730
Union of South Africa	4,300	500	1,800	300	400	7,300
Denmark	2,900	900	2,800	350	250	7,200
Belgium	4,300	350	1,500	350	450	6,950
China	1,400	2,900	1,750	300	400	6,750
Egypt	850	2,200	2,900	250	500	6,700
Cuba	800	100	4,800	60	140	5,900
French West Africa	400	100	5,200	50	20	5,770
Chile	750	100	4,300	80	150	5,380
Norway	1,600	400	2,800	130	200	5,130
Trinidad	140	80	4,400	40	450	5,110
Spain	2,600	200	1,600	160	140	4,700
British Malay	1,000	300	3,000	130	200	4,630
New Zealand	2,400	200	1,400	100	200	4,300
Iraq	350	250	2,700	60	800	4,160
Hawaiian Islands	1,200	200	2,500	140	100	4,140
Philippine Islands	1,000	450	2,300	170	140	4,060
Switzerland	1,800	180	1,400	160	100	3,640
Poland		Included in Germany and Russia				
Colombia	930	135	2,150	27	135	3,377
Ceylon	370	250	2,600	30	10	3,260
Panama Canal Zone	130	30	2,900	30	40	3,130
Uruguay	550	250	1,800	45	45	2,640
Greece	550	150	1,700	60	140	2,600
Peru	500	200	1,550	30	250	2,530
Irish Free State	1,200	550	350	80	250	2,430
Czechoslovakia			Included in Germany			
Finland	1,200	620	140	130	140	2,230
Hungary	650	500	700	120	120	2,090
Algeria	1,000	300	480	90	120	1,990
Puerto Rico	550	90	1,150	40	50	1,880
Palestine	400	450	690	30	200	1,770
Jamaica	230	60	1,400	10	40	1,740
Portugal	650	440	400	80	80	1,650
French Morocco	900	100	340	50	150	1,540
Hongkong	260	70	850	100	20	1,300
Turkey	360	330	450	60	20	1,220
Kenya and Uganda	400	150	600	30	10	1,190
Siam	200	370	370	60	60	1,060
Miscellaneous	6,301	3,107	4,756	705	847	15,716
Total	798,541	153,407	799,426	59,042	213,467	2,023,883

Consumption figures include crude consumed as such, all its products and related fuels such as Benzol, Natural Gasoline, Alcohol used as Motor Fuel. Oil delivered to ships bunkers is included in consumption of country where deliveries made.

The National Interest in Petroleum

By John W. Frey

Associate Director, Petroleum Conservation Division, Department of Interior.

The government recognized no interest in oil during the kerosene era.

National defense and not an imminent shortage of oil gave the original stimulation to the recognition of the national interest in petroleum.

As the economic superstructure built on the use of petroleum products increased, the government came to recognize that the general welfare and the national economy were closely related to and affected by the future of petroleum.

An attitude of cooperation only has been generally the position of the federal government, up to this moment, except on public and Indian lands and except for 20 months during the period of the Code.

During the World War conservation made little headway as the emphasis was on securing increased production, and everyone from 1917 on was out to win the war. According to a number of authorities, the Allies rode to victory on a wave of oil, but it should be added that many Mid-Continent tank bottoms were in sight when the armistice was declared and that considerable oil was received from Mexico. For several years after the war a seller's market continued, with a marked stimulation to exploration and drilling. Doubts were expressed in many quarters as to the ability of the United States to meet its requirements, and the World War experience, with its rapid development of mechanized fighting, seems to have refocused attention on the problem of petroleum conservation.

When President Coolidge authorized the Federal Oil Conservation Board in December, 1924, there was no immediate shortage of petroleum in sight, but quite the opposite; large runs to storage were being made and the potential of the United States and foreign fields was on the upgrade. Nevertheless, Coolidge said, "It is evident that the present method of capturing our oil deposits is wasteful to an alarming degree in that it becomes impossible to conserve the oil in the ground under our present leasing and royalty practices if a neighboring owner or lessee desires to gain possession of his deposits.

"Developing aircrafts," he continued, "indicate that our national defense must be supplemented, if not dominated, by aviation. It is even probable that the supremacy of nations may be determined by the possession of available petroleum and its products. The problem of a future shortage in fuel and lubricating oil, not to mention gasoline, must be avoided or our manufacturing productivity will be curtailed to an extent not easily calculated. Oil, of which our resources are limited, is largely taking the place of coal, the supply of which seems to be unlimited, but coal cannot take the place of oil in most of its higher uses, on land or sea or in the air."

Federal taxes on gasoline and lubricating oils from 1932 through 1938 totaled almost $1,353,000,000. During the

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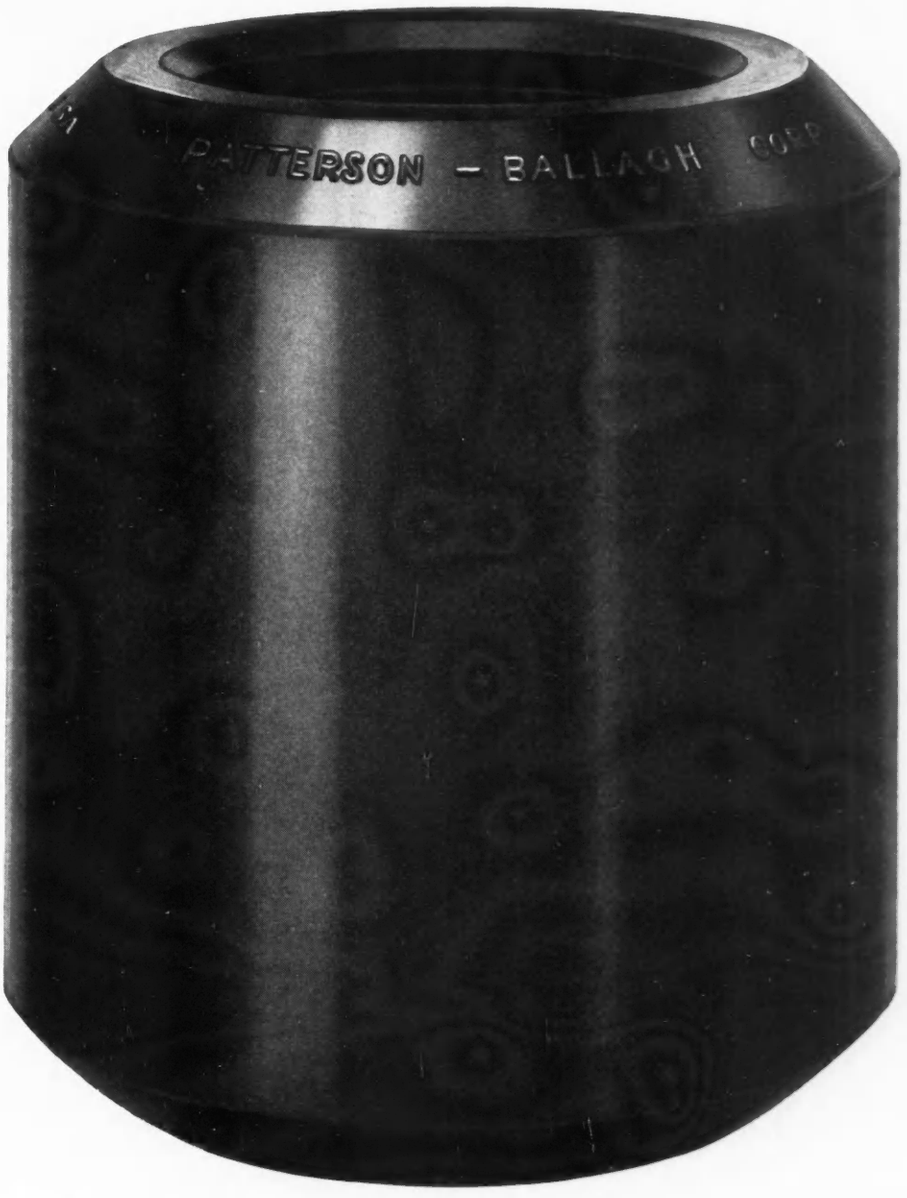

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same period federal highway aid authorizations totaled $1,676,000,000, not including $1,200,000,000 of highway work through the relief programs. The highways in which the federal government has an interest have been built for automobiles, and the present economy of transport is dependent upon a continuous supply of reasonably-priced motor fuel. About 60 percent of the principal energy for transport is derived from gasoline and fuel oils.

The agricultural industry is organized to use petroleum power. Shortage and higher costs of motor fuels would be adverse to agriculture were there not proportionately higher farm prices.

There is no doubt about the petroleum industry being able to meet the current peace-time requirements of the army and navy, but it now appears that one should not be overconfident as to our ability to supply an extensive increased demand as a consequence of war status, as in addition to the military needs the manufacturing and transporting of military supplies would materially augment non-military consumption.

Colonel Rutherford, head of the planning branch of the army, recently said, "In the event of a major emergency the consumption of petroleum products caused by that war would probably be in the neighborhood of at least 15 percent of about what is normally consumed in the country."

Admiral Stuart recently made a statement to the effect that the navy at present uses 9 million barrels of fuel oil. "This represents, at the present rate of refinery practice, the use of 36 million barrels of crude oil," he said. "It might increase, in the event of war, to as much as 50 million barrels of fuel oil, or an equivalent quantity of 200 million barrels of crude oil of the average grade refined in the United States. While many petroleum technologists and economists assure us that the petroleum resources of the United States are ample, it is my opinion that these so-called vast reserves of petroleum are largely dependent on much higher prices because of the greater production and development costs necessary to reduce the oil to possession. The day when oil can be obtained in abundance, quickly and cheaply, from relatively shallow wells is rapidly drawing to a close, at least so far as the resources of the United States are concerned."

The federal government takes the broad position that whether our petroleum supplies are large or small, they should not be physically wasted above or below the ground. Cheap and abundant fuel and power are the very cornerstone of American industry, transportation and business. The people who predict abundant petroleum reserves 50 or 100 years from now do not give bond for the accuracy of their statements.

Discussion

Following presentation of the paper on "The National Interest in Petroleum" by Dr. Frey, John Gill of The Atlantic Refining Company asked Dr. Frey to tell him in what forms the federal government's interest in the oil business should be exhibited.

Frey's rejoinder was: "This is a meeting of economics and technology—not one in which to discuss politics."

William Heroy of Houston said that federal interest in the petroleum industry began prior to 1909. He said that in front of the phrase "national interest" it would be advisable for clarity's sake to bracket the word "controlling."

Mr. Stabler of Washington referred to the government as a sort of landlord of petroleum, saying that he suspected the government was the largest single owner of oil reserves in the country. He explained that about 15 percent of currently known reserves are held to be on government lands of various types.

The Character and Functions of the Monthly Forecasts of Demand Prepared by the Bureau of Mines

By Alfred G. White

Chief Economist, Petroleum Economics Division, Bureau of Mines.

The author, who scored the habit of some organizations in taking the monthly total's of the bureau's forecast and adding them up to get a sum from which to establish long-term policies, stressed that the chief consideration in interpreting the forecasts is recognition of the fact that they are essentially short-term forecasts and nothing else.

There are only two ways to meet a condition of accumulation of gasoline stocks, he said. Either cut the runs or cut the yields, and the logical time to remedy a gasoline stock situation is in the second and third quarters of the year.

Some highlights of his paper follow:

Forecasts made by the bureau now are fundamentally different from those made during the administration of the petroleum code. Today the bureau makes no pretense of setting up allowables. The present forecast estimates represent the total amount of crude oil required to meet the demand by states of origin and are not comparable with either state allowables or with production figures. They represent an estimate of the volume of current operations necessary to maintain a reasonable balance between supply and demand with a view to avoiding unnecessary and wasteful storage of either crude petroleum or refined products. They are issued about the middle of each month to cover estimated requirements for the following month. No attempt is made to base the estimates on relative reserves, ability to produce, or the desirability of such rates of production by states or individual fields. The forecast indicates the actual competitive trend of demand modified only by a reasonable seasonal balance of refinery operations and refined stocks to meet the demand for finished products.

It would appear from the recent optimistic trend of the volume of refinery operations that the industry was looking to increased demand to remedy any refined stock excess rather than to adjustments in runs or yields of products.

While it is one of the functions of the bureau's forecasts to indicate refinery operations that will result in normal seasonal levels for stocks of refined products, the constant reiteration of cumulative corrections distorts the forecasts and seems to have had very little actual effect on the scale of refinery operations. This is the major reason why monthly forecasts of runs and total crude demand are not properly subject to cumulative addition for the year.

Comments

Swensrud, who presided at the afternoon session, remarked at the close of the paper that the question of differentiating between the prices of gasolines and distillates is becoming increasingly important.

W. B. Case, Shell Oil Company, New York, characterized the unbalance between the demand for distillate fuel oil and the required supply of gasoline as one of the most distressing and critical conditions in the oil industry today.

"This running of crude in the fourth quarter to meet the distillate fuel oil demand," Case said, "has resulted in building up gasoline inventories to excessive levels at the beginning of the following gasoline consuming season.

"The demand for distillate fuel oil is growng at a much larger yearly percentage increase than is the demand for gasoline. The percentage yield of distillate fuel oil is not keeping pace with the demand for that product. By the end of the winter refiners will have reduced their distillate fuel stocks to what may be considered the very lowest economic level for convenient operation. They cannot fill out another year's requirements from stocks.

"As a result of this unbalanced condition," Case continued, "and particularly of maintaining crude runs at excessive rates during the fourth quarter, gasoline inventories are likely to reach 83 million barrels east of California by March 31."

Case cited obstructions which the industry has placed on the law of supply and demand as one of the causes of the present state of unbalance. As one of the reasons for failure of the law to function in the industry he observed that most of the companies had adopted a system of cost accounting which results in placing of lower costs on secondary products than on gasoline.

"The propriety of top-price contracts might well be examined with a view to permitting the law of supply and demand to function and refiners should adopt a method of costing which results in a more equitable distribution of costs as between gasoline and distillate fuel oils," Case declared.

Valuation of Oil and Natural Gas Properties

By Lyon F. Terry

Department of Petroleum Economics, Chase National Bank, New York

Valuation is not an exact science and the value of a property cannot be determined down to the last cent, as might at first appear possible by the use of a formula and computing machine. The customary *present-worth* valuation, however, is the primary indication of value and the assumptions upon which it is based as to price of oil and discount rate should be clearly stated.

Estimates under alternative assumptions, if made, provide a range of possible values between reasonable limits based upon favorable and unfavorable eventualities. Such an estimate, based upon unfavorable possibilities, provides an important index to the financial risk

to the owner, prospective purchaser, or mortgagee.

Final judgment of the value of a property involves a competent weighing of the basic estimate of present worth, or alternative estimate or possibilities, and of all other evidence of value.

The present-worth method of valuation involves estimates of reserves and operating costs and economic assumptions as to price and rate of return. Each of these factors is a problem in itself and subject to difference of opinion. The resulting valuation represents a computation of value under the assumptions chosen and is the type of answer arrived at in the usual commercial valuation report. The value computed under these assumptions does not necessarily represent the worth of the property, and the reasonableness of the results should be tested by computations under alternative assumptions.

For example, it is customery to base calculations on the current price of oil, since who can foresee future prices? The fact, however, that forecasting future prices is difficult or impossible does not solve the problem. Hence, one good check on the results is an alternative computation assuming a higher or lower price, depending upon prospects for price changes and the trend of the general oil situation.

Another test is a computation at a higher or lower discount rate. For an estimate based upon reduced future oil prices, a lower rate of discount is justified, since financial hazard is less, and vice versa.

Prior to the inception of proration, the estimation of oil reserves was accomplished largely by the use of decline curves charted for each of the principal fields, and was a relatively simple study of the natural decline of production. With the advent of proration and the improvement of producing methods and technology methods developed in the last 10 or 12 years, the practice of estimating reserves and properties has undergone notable changes. Substitution of a controlled rate of production for the natural decline of wells has introduced the new problem of forecasting the year-by-year production allowable under proration.

Where potentials greatly exceed the allowable production, use of the production-decline method in the calculation of reserves has given way to consideration of the volumetric content of the reservoir and the recovery factor to be obtained.

Proration has extended the deferment of earnings, thereby decreasing the average present-worth factors in valuation calculations. From the standpoint of the value of the property, there is an optimum rate of production at which the advantage secured by increased recovery is equally offset by the opposing effect of prolonged deferment, and where these two curves cross will be found that operating condition under which the maximum value of the property will be realized.

Economic Dynamics of the Domestic Demand for Motor Fuel

By Norman D. Fitz Gerald

Petroleum Economist,
Chase National Bank, New York.

Major factors affecting the domestic demand for motor fuel have been formulated, weighed, and presented in a mathematical expression standing the test of reason and opening the way for further investigations in petroleum economics. It has been established that although the most essential item in determining the consumption of motor fuel is the number of motor vehicles registered, price is a prime consideration, while minor roles are played by the mileage of hard-surfaced highways and national income.

Demand is also encouraged by certain non-quantitative elements, which have not been included in this study, such as more comfortable cars, better roads, decentralization of industries, and increasing leisure. These and other factors will combine to augment domestic fuel requirements as motor registrations mount toward the inevitable though distant saturation level, the proportion of heavy units, such as trucks and busses rises, the web of highways expands, and as consumption in the air, on the water, and on farms and for non-automotive purposes increases.

However, it should not be overlooked that shifts in economic balance or technology, such as important changes in costs, standards of living, efficiencies of internal combustion engines, sources of energy or alterations in the socio-economic structure of the country might supervene and accentuate or stunt the growth of demand or distort the relationship now regarded as normal.

On the average, a general reduction of 1 percent in the price of motor fuel may be expected to have a direct effect in raising consumption of only about 0.37 percent, which is the elasticity of demand with respect to price. When this coefficient is less than 1, the increase in volume accompanying a reduction in price is gained at a loss of gross income from sales of the product. Therefore, cutting prices below normal levels without a corresponding reduction in cost would be impractical and economically unstable. If consideration is given to the inflexibility of the tax, the average effective elasticity of demand is reduced from 0.37 to 0.34.

This low effective elasticity of demand, combined with the rather uniform character of the products of the major suppliers, is the genesis of some of the intense and vicious competition in marketing. A short-lived reduction in prices does little to stimulate demand but is a major controlling influence in shifting it from one seller to another without appreciably increasing the total amount of business. The re-establishment of the equilibriums of price and distribution of volume under such conditions is peculiarly difficult.

Cooperative Pressure Maintenance In A. I. M. E. Spotlight

PRESSURE maintenance in the largest cooperative pressure maintenance project in the world, that at K-M-A field in Texas, was a subject that took the spotlight at Production Engineering sessions of the Seventieth Annual Meeting of the American Institute of Mining and Metallurgical Engineers in New York February 12 to 15, inclusive.

These sessions, at which W. H. Geis, Union Oil Company, California, presided, studied 12 papers representing a wide range of subjects dealing with today's and tomorrow's problems of the production engineer.

One paper told of a device that promises, not today, but possibly a few years hence, to revolutionize certain aspects of petroleum exploration and refining. It was presented by Herbert Hoover, Jr.

Abstracts of the papers presented follow:

Trends and Observations in Pressure Maintenance Practice

By E. O. Bennett

Chief Petroleum Engineer,
Continental Oil Company

Compressor-manufacturers are prepared to furnish machinery for any duty required for the return of gas to producing zones. During the last three years in excess of 85,000 horsepower

in compressor capacity has been installed in pressure maintenance and condensate recovery projects in the United States.

Under average conditions, the 85,000 horsepower is estimated to return 800 billion cubic feet of gas per year to formations, a volume which contains 734 million horsepower hours of energy available for recovery of oil, for prevention of pressure decline and surface condensation, and for retarding water encroachment.

There is being returned and saved an amount of gas equivalent to 35 percent of all natural gas consumed in the country. The amount returned soon will exceed the natural gas requirements of the country.

All of the cooperative projects now in operation were initiated because of the increased recovery and return on investment which would accrue. The K.M.A. pressure maintenance program is the largest cooperative development ever undertaken in the history of the industry and shows that producers are quick to take advantage of modern technique without compulsion of state or federal authorities.

K.M.A. has reduced daily per well allowable from 58 barrels in the early life of the field to 25 barrels in 1940, causing waste on account of excess gas and inefficient flow. A company owning three gasoline recovery plants suggested to the pool's 134 operators a pressure maintenance system. It was accepted. A well spacing pattern allocating one input well to every 22 producers, regardless of lease lines, was worked out. Two major gasoline plant owners agreed to install the compressors, necessary field lines and meters for return of residue gas to the producing zones.

All of the gas returned to any zone is paid for by operators in that zone, being prorated on a well basis, regardless of the input well location. This has averaged about $2.50 per well per month, less than the value of casinghead gas extracted from each well each month.

The average number of barrels produced per pound of pressure drop prior to pressure maintenance was 795; since return of gas to the formation this figure has risen to 9290 barrels. Gross gas/oil ratio from the wells is 685. The net ratio, after giving credit for the gas returned, is 360 cubic feet per barrel.

When a producing well used for input purposes was shut in for three or four weeks the gas gradually spread horizontally over a large area and the well could be put back on oil production, so that K.M.A. input wells may be changed from time to time.

The plant operators have made a schedule for well flowing that keeps a fairly uniform load factor throughout the 24-hour day to keep from overloading the field gasoline plants at given hours. A uniform load condition throughout the field will be of great value towards increasing ultimate recovery.

Numerous details of such a large undertaking are performed by an engineer and assistants. These salaries and the equipment necessary for the work cost the operators of the pool 0.07 cents per barrel. The engineer supervises distribution of gas, taking bottom hole pressures, scheduling well flow, and furnishes reports to the producers, whom he also represents in any problems that come before the Texas Railroad Commission.

There are numerous high pressure reserves of gas on the Gulf Coast of Texas and Louisiana, some of which contain recoverable liquids in amounts up to 25 barrels per million cubic feet of gas. Vapor in high pressure formations exists in a single phase. A slight reduction of either pressure or temperature, or both, causes partial precipitation of liquid to take place. The precipitate wets the formation and becomes irrecoverable.

[The author quoted from the December 12, 1938, issue of THE OIL WEEKLY an article from the engineering department of the Texas Railroad Commission describing the above phenomenon.]

In a newly discovered field with the formation containing vapor from which condensate may be recovered, it is well to determine the subsurface dew point upon completion of the first well in order that a compressor plant may be designed to handle the production properly. Condensate from pool, obtained by permitting the vapors to pass through the retrograde range, where they revert to liquids and gases, will be the greatest where such changes are made to take place under control outside the producing zone.

Condensation without refrigeration equipment may be effected by pressure reduction alone, calling for an increase in compressor horsepower. Recent work done with high pressure absorption liquids of different weights indicates that this type of cycle will have a definite place in future recovery operations.

It is the author's opinion that the presence of gas-carrying condensate vapors indicates the possibility of finding oil pools of much greater depths than have yet been drilled. An area in Louisiana has a condensate type pool with a pressure of 7510 pounds per square inch—an oil pool may exist at approximately 16,000 feet.

[The paper then goes into discussions of such subjects as completion and operation of input wells in pressure maintenance and condensate recovery projects, well spacing and ultimate recovery under pressure maintenance, pressure maintenance versus new drilling, and formation pressure decline in pressure maintenance operations.]

Measurements of the Viscosities of Oils Under Reservoir Conditions

BY C. R. HOCOTT AND STUART BUCKLEY
Humble Oil & Refining Company, Houston.

A simple rolling-ball viscosimeter has been constructed which has been used successfully for routine determination of the viscosity of subsurface samples of oil at reservoir temperatures and pressures.

The instrument is adaptable to the measurement of a wide range of viscosities through positive variation of the roll angle, variation of the diameter of the barrel, and variation of the size of the ball.

It has been found through examination of a large number of subsurface oil samples that the viscosity of an oil is at a minimum at the saturation pressure and that the release of dissolved gas attending the reduction of the reservoir pressure results in increased viscosity of the residual oil. The nature of the variations of the viscosity with pressure is such that direct measurements on subsurface samples appears at the present to be the only feasible method for determining the viscosity of any particular oil under reservoir conditions.

The apparatus used in reaching the above conclusions consists essentially of a removable, accurately bored cylindrical barrel of ¼-inch nominal internal diameter, 8 inches long, in which a closely fitting steel ball rolls through the oil with the barrel inclined at a definite angle. The ball makes contact at one end of the barrel with an insulated electrode, closing an electrical circuit which actuates a buzzer. The measurements consist essentially in determining the time required for the ball to travel the length of the barrel.

The barrel slides snugly into a steel bored cylinder, an upper external shoulder of the barrel compressing a small spring, and is held in place by a hollow nut. The spring prevents the barrel from seating against the bottom of the bored hole in the cylinder, while narrow, external longitudinal slots in the barrel permit fluid to flow around it and through the bottom.

The upper part of the recess in the cylinder is enlarged to form a tapered chamber which acts as a reservoir for the oil and affords space for agitation to insure equilibrium between gas and oil. The taper permits the ball to roll readily into the barrel when the instrument is inclined 75 degrees. The upper end of the chamber is sealed by a piston seated on a shoulder, the closure made with a gasket smaller than the lower surface of the piston. Primary gasket compression is effected by means of a hollow nut which slips over the piston.

A retractable plunger is screwed through the cylinder head. It may be turned with a wrench while the instrument is immersed in a high temperature bath. During measurement the plunger is screwed into the cylinder, sealing the upper end of the barrel and simultaneously sealing the lower end by pressing it against a gasket.

Mounted on trunnions, the cylinder may be rotated through an angle of 330 degrees. The trunnions are arranged to permit use of a bubble level in aligning the instrument for a viscosity measurement. The trunnion plates are equipped with stops permitting the roll of the ball to be varied in the ratios of approximately 4:2:1 for any given viscosity and size of barrel and ball.

Bottom of the cylinder enclosing the barrel is closed by an adapter nut which carries the electrode.

Auxiliary apparatus consists of a vacuum tube relay and buzzer circuit for indicating the instant of contact of the ball with the electrode, a calibrated

steel tube bourdon pressure gauge, a manifold with valves for admitting and withdrawing the sample, and a water bath with electrical heating coils and thermostat.

Steady Flow of Gas-Oil-Water Mixtures Through Unconsolidated Sands

By M. C. Leverett and W. B. Lewis

Humble Oil & Refining Company, Houston.

A summary of the experimental data taken from various tests indicated the following:

1. Relative permeability to water is determined by the water saturation alone, and is not affected by the introduction of an additional non-aqueous phase.

2. Relative permeability to gas in three-phase flow is slightly less than would correspond to the same gas saturation in two-phase flow.

3. Relative permeability to oil varies in a more complex manner, being in some regions less and in others more than for the same oil saturation in two-phase flow.

4. Isoperms for all components are independent of the viscosity of the oil phase. Points determined using kerosene and points using the more viscous blended oil fall along the same isoperms.

5. The presence of appreciable amounts of all three phases in a flowing stream in equilibrium with the fluid in the pore space is limited to a relatively small region of pore composition.

It is possible, by regarding unsteady flow of fluid mixtures as a succession of steady flow states, to predict in part the behavior of reservoirs from steady state simultaneous flow data obtained in laboratory studies. The presence or absence of connate water is not an important factor in the recovery of oil by the gas expansion method. The substantial independence of gas-drive oil recovery from connate water has been confirmed by direct laboratory experiment. Hence, the oil remaining uncovered must vary inversely as the connate water saturation. For this reason, estimation of connate water saturation is of primary importance where secondary recovery methods are to be considered.

Where Gas Is Present

Where gas is present, the mode of water flow is unchanged, but since gas tends to occupy the central portions of the inter-grain spaces, where also the oil is forced by capillary forces, interference between oil and gas flow appears likely. Visual examination under the microscope shows the presence of an oil film (in some cases containing a very small amount of finely divided water) through which oil flows around each gas bubble. It is not clear whether all gas bubbles are connected.

Finally, the increase in oil permeability at constant oil saturation as the water saturation is increased from zero is clearly due to the shifting of the oil into parts of the inter-grain spaces where it may flow more freely. The water introduced tends to occupy the sharply curved parts of the cores, forcing the oil into the central space vacated by the gas. Since fluid in the sharply curved parts of the pores moves only with difficulty, and that in the center moves readily, the result is an increase in oil permeability.

The Eykometer, a New Device for Measurement of the Yield Point of Clay Suspensions and Oil-Well Drilling Muds

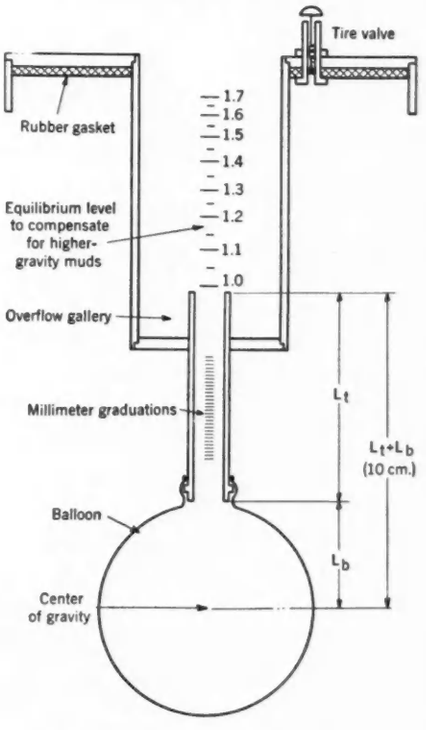
By A. George Stern

Chemical Engineer, Bureau of Mines, College Park, Maryland.

The Eykometer, designed to make static measurements of the yield value of a mud fluid directly, consists of a transparent tube, to one end of which is fastened a small rubber balloon. It has the following characteristics: the inner diameter of the tube is 1.00, plus or minus 0.02, centimeters; the length of the mud column is 6.4, plus or minus 0.1, centimeters; standard, widely available balloons, (No. 9 round) are used; correction for difference in density of the mud being tested and the water used for hydrostatic head is made by pre-calibration with a heavy density fluid; an overflow gallery is provided to aid in uniform filling of the balloon and column of mud; a simplified air vent in the form of an automobile tire valve is used to release excessive pressure; the entire apparatus, except the balloon, is made of a new, crystal clear plastic.

The balloon and tube are always filled to the same level, and the mud column in the eykometer is accurately defined as the length to the top of the tube where it overflows. Attention may be focussed on the initial motion of any observable particle in the tube and need not be directed to the meniscus level. These distinct advantages for precision readings are limited only by the necessity of always filling the balloon and tube completely.

In making a test the balloon and eykometer tube are fastened into a chamber so that the eykometer rests in a position on the rubber gasket and a specially provided weight placed on top holds it in position. The chamber may be filled with water to any desired height by means of a movable leveling bulb. The sample of mud to be tested is placed in the balloon by means of a small plunger pump, the amount being adjusted so that it just fills the inner transparent tube and the balloon.



Sketch of Eykometer Tube Made of Lucite.

Simultaneously, the water level in the chamber is adjusted to a previously calibrated position on the overflow gallery so that the mud in the balloon is at equilibrium and is not being subjected to stress. This equilibrium condition is determined by previous calibration with several liquids of known low viscosity and high specific gravity (aqueous solutions of hypo, for example). The effective length of the mud column then is the height of the mud in the tube plus a height equivalent to half the height of the balloon.

It was found that the forces may be considered to act to a point approximating the center of gravity of the balloon. It was also found that although the visual center of gravity of the balloon is displaced downward with high specific gravity liquids, the resultant tension in the neck of the balloon, combined with the above mentioned calibration, restores the effective center of gravity.

To measure pressure required for yield the leveling bulb is raised slowly while the mud in the tube is watched to determine the point at which flow starts. Raising the leveling bulb subjects the mud to an increasing hydrostatic head whose magnitude is measured by the rise in height of the leveling bulb. When the pressure for yield is reached, incipient flow of the mud in the tube is observed—an upward motion of one millimeter in the tube for a particle of mud having been selected as a suitable criterion. When it occurs, the hydrostatic head increase in centimeters of water (equivalent to grams per square centimeter) is noted and recorded as a measure of the yield value.

Fundamental Forces in Petroleum Production

Part I—Theoretical

By S. T. Yuster

Penn State College

Although the number of barrels of oil produced annually is of astronomical magnitude the actual production process takes place in capillaries that are on the average of microscopic dimensions. Terms such as viscosity, surface and interfacial tensions, capillary size distribution are often referred to in production technology and these forces are manifesting themselves in the tiny channels making up an oil sand.

Although these channels are interconnected and of varying cross sections, it would be impossible to analyze the behavior in such a complex structure. To better understand the mechanism of oil production, this paper considers flow through single capillaries and through a system of parallel capillaries.

The displacement of oil by a single capillary in which the drive liquid preferentially wets the wall is analyzed theoretically. The effect of the presence of an interface is shown to partially nullify a portion of the applied pressure differential. If the oil preferentially wets the wall instead of the water, the presence of the interface acts as if the

flooding pressure gradients were increased.

Presence of two capillaries having different radii and arranged for parallel flow was next considered. In the case where the drive fluid wet the wall the flood penetrated both capillaries under practically all conditions. And an oil residue in this case was due to (1) orientation of capillaries perpendicular to the direction of flow; (2) retention because of Jamin action. In the case where the oil wets the sand surface, retention of oil is due to: (1) orientation of capillaries perpendicular to the direction of flow, (2) residues at grain contact, (3) Jamin action, and (4) failure of the water to penetrate a capillary because its resisting pressure is greater than the drive pressure.

Part II—Experimental

By S. T. Yuster, L. T. Bissey, J. C. Calhoun, T. G. Cook

The authors presented equations which gave the rate of penetration of the drive into the capillaries as a function of capillary size, interfacial tensions, contact angle, viscosity, etc.

To evaluate these theoretical considerations, some experiments on artificial pyrex sands were observed microscopically. Capillary by-passing was shown to exist and accounted for some of the residual oil.

The presence of a capillary resisting pressure was shown during the flooding of a packed tube fitted with a series of manometers. As the interface crossed a given manometer the pressure rose immediately. This rise pointed to an apparent wetting of the sand by oil. Similar experiments with samples of Bradford sand gave evidence of a capillary resisting pressure which could be explained by a preferential wetting of the sand by oil.

Pressure Distribution About a Slotted Liner in a Producing Oil Well

By Frank G. Miller, *U. S. Bureau of Mines, San Francisco.*

Little information concerning the nature of the flow of reservoir fluids in oil-bearing sands in the immediate vicinity of slotted or other types of perforated liners has been published, even though information on this subject is of fundamental importance in many studies relating to oil-well behavior. The dearth of this scientific knowledge is admitted by many engineers, but the advantages to be gained by operators of producing oil properties through proper selections and applications of perforated liners is just beginning to be recognized by them.

The effect of slot size on the pressure distribution about slotted liners in producing oil wells was investigated in the laboratory under certain idealized conditions in a study having the purpose of obtaining further information for the guidance of engineers.

A perforated liner, if functioning properly, prevents entry of sand into the well bore and at the same time permits the influx of oil, but flow restrictions of the liner materially affect the pressure gradient in the vicinity of the wall of the well. The magnitudes of the energy losses incident to the flow of reservoir fluids through oil-bearing sands to the inside of liners depend partly on the size of the slots in the liners as well as on characteristics of the sand. By improved liner design and proper selection of liners it may be possible to reduce these losses and thereby extend the natural flowing lives of wells and increase the initial flowing capacities of small wells.

These factors are of economic importance to operators because of lower costs of producing naturally-flowing wells as compared with operating costs resulting from the use of artificial lifting methods.

Laboratory investigation described in the report was conducted with a fluid-through-sand apparatus and an electrolytic conduction model, both of which simulated the objective. Only rectangular slots having their long axes parallel to the well axis were considered in this study. The most pertinent results of the investigation suggest these conclusions:

1. Formation of a sand bridge over a rectangular slot does not entail an additional energy loss, providing the slot is wide enough, regardless of the rate of flow.

2. Neglecting the effect of sand bridging over slots, the crowding of the flow lines in the sand near the slot causes a separate loss which is dependent on both slot width and length; but length is the more important variable.

3. A slotted liner does not affect normal flow conditions in the sand beyond a distance, measured from the well axis, of three times the well radius.

4. The laboratory method used would be applicable in studying possible pressure conditions about most types of perforated casings used in producing oil wells.

At the beginning of the investigations the following assumptions were made regarding the bottom-hole conditions of the oil sand reservoir: (a) conditions of steady flow exist; (b) single-phase homogeneous liquid is being produced; (c) no contaminating material, such as drilling mud, is present between the liner and the face of the oil-bearing sand; (d) the well is vertical and completely penetrates a horizontal sand stratum of uniform thickness occurring between two impermeable strata, and (e) the flow is wholly viscous.

Reduction of Water in Marginal Oil Wells

By Fred Plummer
University of Texas, and
H. K. Livingston
University of Chicago.

This paper, which tells of laboratory tests with oil sands and not actual tests in wells, suggests that under certain conditions downward withdrawal of oil from a reservoir is better than the conventional upward withdrawal with respect to the ratio of water produced along with the oil.

Whether an oil well produces rapidly or slowly, the percentage of water produced with the oil increases as long as the water continues to penetrate the sand. If the pore spaces of the sand are all very fine, then the water cone is held up by capillary forces and will not recede.

The apparatus used by the authors in the study of radial flow of oil-water mixtures through sand permitted observation of the effect of different water cones and water sheaths on the percentage of water produced, observation of the effect of different detergent chemicals on water cones and comparison of water ratios in wells where the fluid was withdrawn downward with normal flows where the wells were produced upward.

Examination of cores used in the apparatus showed that downward withdrawal of oil drew the oil-water interface downward in an inverted cone and that the oil occupied a greater percentage of the interstices in the sand than in the sand core in which the water cone was produced by upward withdrawal. Fine grained oolitic limestone cores, after producing for 100 hours or more under given laboratory conditions, yielded 2 percent oil and 98 percent water when the fluid withdrawal was upward. The same limestone yielded 21 percent oil and 79 percent water when produced downward.

Use of aerosol OT, a chemical for reducing interfacial tension between water and oil, resulting in obtaining with the apparatus a flow of 68.4 oil and 31.6 water when a fine-grained oolitic lime core was utilized.

Engineering Factors Essential to Conservation

By E. G. Dahlgren
Associate Valuation Engineer, Securities and Exchange Commission.

A wide variance exists between engineering factors adopted in conservation regulations of various oil producing states. If one state is successful in combatting wasteful practices by wise administration of conservation laws, based upon sound engineering factors, a splendid example is set for other states to follow.

A medium for interchange of ideas is already established in the Interstate Oil Compact Commission, whose members meet periodically to discuss conservation problems.

No difficulty should be encountered in initiating a program for a study of conservation methods to reach the objective of improving and establishing adequate conservation laws and regulations for every oil producing state. The author advocated this program in an article in The Oil Weekly of July 17, 1939, page 30, titled "The Future of the Interstate Oil Compact."

Arkansas is perhaps the foremost state in engineering technique in conservation. If all states had similar regulations and enforcement, there would be little necessity for the proposal of the federal government to supplement the state authority in enforcement of conservation measures. In Arkansas the conservation body is an engineering unit with only engineers and engineering data used in the conservation program. Arkansas allocates field quotas on the basis of waste prevention rather than on market demand.

[The author at this point took up conservation measures and enforcement methods in Oklahoma, Kansas, Texas, California, and Michigan. He told of the progress made in each in applying engineering factors in control activity.]

Kansas conservation laws still keep

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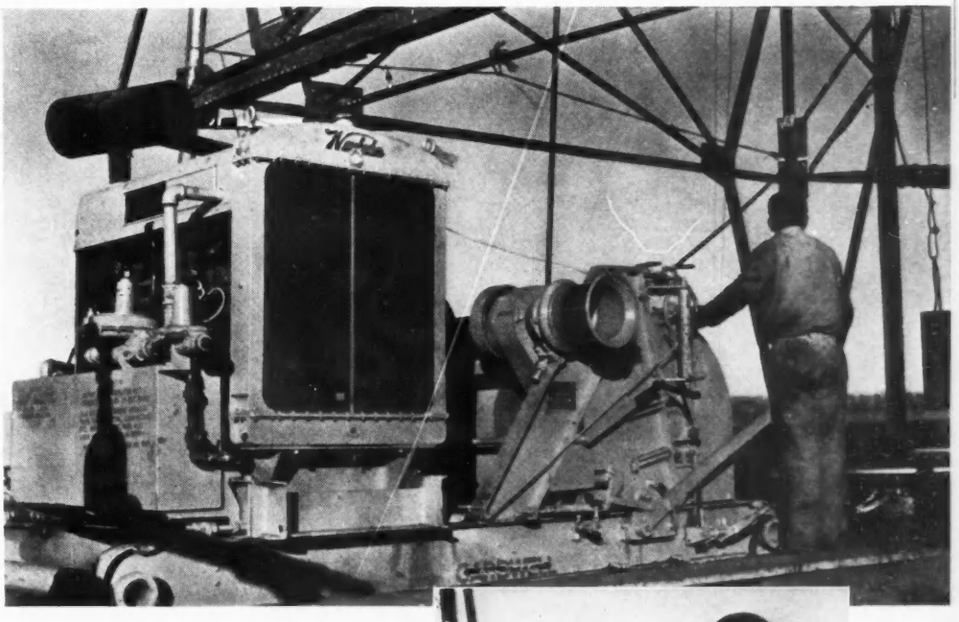

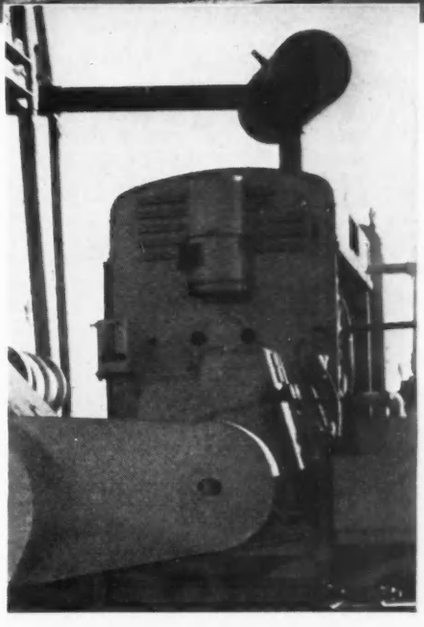

Field views of Cardwell *Model L Slim Hole or Workover Draw Works. The prime mover is a butane-burning Model GAKU* 6-*cylinder,* 100 *to* 150 *horsepower* WAUKESHA POWER UNIT *with a Twin Disc* HYDRAULIC TRANSMISSION. *This thoroughly modern power unit has such advanced Waukesha features as built-in governor, 7-bearing crankshaft, replaceable cylinder sleeves, overhead valves, and hardened, heat-resisting exhaust valve seat inserts.*

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emphasis on well productivities. Constitutionality of these laws is being tested in the courts in the matter of allocating the total market demand of the state on a mathematical basis which disregards engineering principles in the determination of proper allowables. It does not take into account studies of pool reservoirs.

The California Oil Umpire's Method for Determining Well Potentials from Subsurface Pressure Data

By E. G. Trostel

Petroleum Engineer,
Union Oil Company of California
(Paper presented by W. H. Geis, chairman of the meeting)

Acceptance of potentials determined by means of subsurface pressures in California curtailment has been in operation but a few months, although pressure data have been used to supplement production records for several years.

Up to February 1 the potentials of approximately 400 wells have been set from pressure data, and the list of operators taking advantage of this method is rapidly growing. Demonstration of high potential flowing wells has been reduced, and overproduction from demonstrations of pumping wells likewise is being reduced. However, it was found necessary to require sufficient sustained production rates for flowing and gas-lift wells for the pressure test that the accumulated test production in some instances will exceed that of a simple open flow test.

As more pressure data are turned in the umpire's engineers will continually increase the accuracy by which they may decline well potentials, and the time between complete potential tests will be greatly increased with an additional reduction of excess production and operating expense. The present rules permit the installation of smaller pumping equipment, flow lines, and traps without appreciable loss of allotment but with a large saving of capital investment. Finally, as the gathering and use of subsurface data become widespread, there will be an increase in the knowledge of well performance and reservoir behavior.

Determining Potential

The procedure for determining a well's potential lies in establishing a pressure rate relationship characteristic of the well. The resulting curve is then exterpolated to a rate corresponding to the minimum back pressure which may be held against the formation in accordance with the production characteristics ensuing from the method of production. Mean pressures are used in exterpolation, except in doubtful cases.

Flowing and gas-lift wells are grouped separately from pumping wells in determination of limiting back pressure. The first classification calls for adding a fixed surface back pressure of 30 pounds to the vertical flow-pressure loss encountered at the highest demonstration rate during the test. In pumping wells the limiting back pressure is determined by the position of the operating fluid level.

Depth-pressure gauges are used for determining subsurface pressure in flowing and gas-lift wells. In the pumpers the gauges and sonic fluid-level-locating equipment are used.

The rules specify that equilibrium must be attained in determining production rates.

A discount formula used gives to a well a fraction of the difference between the calculated potential and that production rate on the pressure rate curve which is thought to be adequately established.

A Study of the Effects of Temperature and Pressure on the Properties of Oil Well Cements

By R. Floyd Farris

Stanolind Oil & Gas Company, Tulsa

High pressure greatly accelerates stiffening and setting of a cement slurry. The effect of high temperature in connection with high pressure is to further accelerate the stiffening and setting of a slurry. At a pressure of 5000 pounds and 180° F., most of the cements tested stiffen too rapidly to permit proper placement in a deep well. At the same pressure and 200°F. all cements tested stiffen beyond the limit of mobility immediately. Agitating a slurry at high pressures after rapid stiffening begins is detrimental to strength of the set cement. The point on the consistency-time curves where rapid stiffening occurs should be regarded as the maximum recommended pumping time, instead of using any viscosity or consistency limit, such as 40 "poises," as a "limit of pumpability."

The practical solution of many of the present high-pressure and high-temperature cementing problems will probably be solved when cements are improved so as to permit the placement of a uniform, mobile and good quality slurry at any given practical high temperature.

Geochemical Exploration (Soil Analysis)

By Eugene McDermott

President Geophysical Service, Incorporated.

Method of geochemical exploration permits quantitative measurement of microscopic oil and gas seeps and mineralization phenomena that cannot be detected visually. These methods should supplement established geophysical methods and will, under certain conditions, be applicable where the latter have been unsuccessful.

Leaks at Edges

In most cases the maximum leakage from a buried oil or gas accumulation occurs over the edges of the accumulation rather than over the top. Geochemical exploration locates the buried reservoir by measuring the leakage from it. It is a direct method of search in contrast to other methods which measure structural anomalies.

The paper observes it is logical to conclude that both buried vegetable matter and the basement rocks are sources of the gases from which oil and gas fields are formed. They are organic. However, if in either case one goes one step farther in the direction of the origin, it is found to be inorganic. The author then asks, "in view of this, can it be said that there has ever been an organic theory of the origin of oil and gas?"

Geochemical exploration is not predicated on this theoretical conception. The theory is derived from the data of geochemistry.

A Preliminary Report on the Application of the Mass Spectrometer to Problems in the Petroleum Industry

By Herbert Hoover, Jr., *president United Geophysical Company, Pasadena, California, and*

Harold Washburn
Director of research, United Geophysical Company.

This paper is in the nature of a rough preliminary report on the progress which has been made in the application of the mass spectograph to various problems arising in the petroleum industry.

Through use of this apparatus it is possible to run a qualitative and quantitative analysis on an unknown mixture of gases with an accuracy of better than + or —5 percent of each of the various constituents and a sample of only 0.1 cubic millimeter (about the size of a pin head) is required for the test. Results of the analysis may be obtained in 10 minutes. The mass spectrometer is able to determine the "packing fraction," which is the difference of the way neutrons and protons are bound, expressed as a fraction of anatomic weight.

Unlimited Possibilities

It was brought out in discussion that the spectrometer has almost unlimited possibilities in the next generation or so in expediting the discovery of oil through soil analysis and in breaking up and reforming crude and portions of crude oil in refining processes.

The spectrometer consists of an ionization chamber, an analyzer tube, a collector and an amplifier. The first three are enclosed in an air-tight chamber which is kept under a high vacuum. This container is placed in a uniform magnetic field, preferably supplied by a large electro-magnet. Gas to be analyzed is introduced into the ionization chamber through a capillary leak or gas inlet. Upon entering the chamber the gases are bombarded by low-voltage electrons emitted by a filament. This ionizes the molecules and they become positive ions. These ions are accelerated toward a slit which is kept at a small negative potential with respect to that of the rest of the chamber. The ions then are further accelerated toward another slit, which is kept at a large negative potential.

Spectrometer Measurements

The path the ions take is circular, due to action of the magnetic field. By proper adjustment of either the magnetic field or the accelerating voltage, ions of any desired mass can be made to follow a predetermined radius of curvature and thus pass through an exit slit and strike the collector, where their quantity is measured by a suitable vacuum tube amplifier and a galvanometer, or recorder.

To complete the analysis it is then only necessary to determine the relation between these spectrometer measurements and the amount of gases or vapors present in the vapors being analyzed.

Censorship Curtails A. I. M. E. Worldwide Symposium

An attitude of uncertainty with reference to behavior of oil countries outside the western hemisphere developed at the Foreign Production Symposium session of the American Institute of Mining and Metallurgical Engineers in New York February 14.

Key nations in today's international oil picture—such as Russia, Rumania, Germany, Iran—were not represented by prepared papers on the program, and the paper on Iraq was, as usual, off the record until approval of its publication could be obtained from abroad.

War censorship cut down to surprisingly few the papers that did arrive, but the chairman of the meeting, James Terry Duce, was able to tell something of activities in several of the countries not represented by papers or elicit a remark on them from some member of the audience.

Remarks on Venezuela by Ben B. Cox, Socony-Vacuum Oil Company, were not made available for abstracting, but the sense of discussion on this country was that Venezuela may be expected to show an increase in production during 1939 and that Eastern Venezuela may be expected to grow in importance as a source of new reserves.

Ecuador's most interesting development of the year seemed to be discovery of oil in crevasses of lower sands hitherto thought unproductive on the Ancon Peninsula.

Bolivia, Chile, Paraguay, Uruguay, Argentina and Brazil were not represented by papers.

Difficulties between private enterprise and the Bolivian government continue unsettled, and chances are production will continue to decline in 1940 under government operation of the confiscated fields. Opinion seemed to be that 1940 production in Bolivia would not reflect any results of current negotiations between that government and Argentina for help from the latter's Yacimientos Petroliferos Fiscales in development of new production.

Talk on Argentina brought out that a discovery well at Tupungato had chalked up an initial production of 500 barrels an hour from a thick Cretaceous sand. The strike is just south of Mendoza and indicates the possibility that a long north-and-south syncline in that section may prove productive in spots.

Discussion on Hungary, led by Dr. W. P. Haynes, in absence of a paper thereon, brought out that 29 completions had been recorded in Lispe (Budafapuzsta) for initials ranging from 150 to 300 barrels. In addition there were 3 failures. Hungary's domestic needs run from 5000 to 6000 barrels daily. The field furnishes 4500 barrels daily.

Rumania, which found no new fields during the year, was credited with producing 46,500,000 barrels. It is expected to decline in 1940.

Basil B. Zavoico, who talked on Russia, said the reserve rating of Apsheron Peninsula had been increased during the year and mentioned an important discovery of oil in Crimea and the first commercial salt dome production in 1939 for the Ukraine. Zavoico figured the 1939 Soviet production at 219 million barrels and predicted an increase for 1940.

Egyptian production increased to 5,100,000 barrels in 1939 as against about 1,600,000 in 1938, due wholly to Ras Gharib, a new field. Wildcatting will continue active there in 1940.

While no paper was presented on Iran, it was brought out that reserves there probably were substantially increased during 1939. Dutch East Indies also were among the missing, so far as papers were concerned, but considerable activity was predicted for Sumatra and Borneo.

India's contribution to the meeting was a paper covering 1938 activities. Tomorrow's picture for that part of the world, however, hints at considerable activity in the Indus basin because of discoveries in the Dhulian neighborhood in the northern part of the country.

Wildcatting in New Zealand and Australia failed to develop anything worthwhile.

Trinidad, whose oil industry news falls under the censor's ax, was estimated to have produced 19,250,000 barrels in 1939 and is expected to do better than that in 1940. The year's increase was attributed to development of the Coora field.

Activity in Santo Domingo resulted in completion of a 250-barrel well at 470 feet and a failure at 3000 feet. The oil has a good lube content but practically no gasoline.

Following columns are abstracts of all papers which arrived at the meeting in time for presentation:

Greater detail on papers presented before the Foreign Production Symposium of the Institute on February 14 in New York will be published in connection with the International Issue of *The Oil Weekly* on March 18. Limitations on space prohibit doing so at this time, as well as the fact that many of the scheduled papers did not arrive in time for presentation before the symposium.

The International Issue of *The Oil Weekly*, will include as much of the detail of the institute's foreign proceedings as is commensurate with that organization's rulings on abstracts, plus a wealth of additional information gathered from private sources on many foreign countries.

Petroleum Developments in Saudi, Arabia

By J. O. Nomland
Assistant Chief Geologist,
Standard Oil Company of California

Last year's activities of California Arabian Standard Oil Company were restricted to Damman Dome and wildcatting in other parts of the concession.

While early production at Damman came from 2000-2200 feet, all later development has been directed at the Arab zone, found at 4300 feet. General spacing is 3000 feet; 15 wells have been completed and 5 wells are drilling or completing.

There are two important wildcats on the concession. The Abu Hadriya test, 100 miles northwest of Damman, is drilling below 8655 feet without having encountered commercial oil. The Ma'agala test, 120 miles west of Damman, has drilled to 1372 feet without commercial showings. Both are on large domes.

Damman produced 3,933,903 barrels in 1939. Production is being delivered to tidewater at Ras Tanura by way of a 40-mile, 10-inch line. A small stabilization plant has been built at the field.

Petroleum Developments in Canada in 1939

By G. S. Hume
Department of Mines and Resources, Ottawa.

Canadian production in 1939 amounted to 7,743,313 barrels, a substantial increase over the 6,956,229 barrels produced in 1938.

Turner Valley supplied 7,456,000 barrels of the total, or 96 percent of Canadian production.

Divided by Provinces, Canada's 1939 production was as follows: Alberta, 7,500,000 barrels; Ontario, 207,500 barrels; New Brunswick, 18,800 barrels, and Northwest Territories, 17,013 barrels.

Turner Valley now has 3600 acres proven for oil and 10,000 for gas. Its cumulative production to the end of 1939 was 27,478,850 barrels. Total completions in the field number 216, of which 34 were completed in 1939. The field had 96 oil

wells and 104 gas wells on production at the end of the year.

Canadian wildcatting generally was unsuccessful from the standpoint of commercial production development. At Lloydminster two oil wells have been completed on the Alberta side and one on the Saskatchewan side of the field. The oil is very heavy. Thirty miles west of Lloydminster another heavy oil pumper has been completed on the Battleview structure.

Warwick field of Lambton County, Ontario, recorded a number of shallow completions during the year. Some of these initialed as much as 100 barrels but declined rapidly.

Malahide, Elgin County, a new gas field, recorded 20 completions during 1939.

Petroleum Developments in Colombia During 1939

By O. C. WHEELER

Chief Geologist, International Petroleum Company, Ltd.

Colombia's production of 23,774,151 barrels in 1939 constituted a new high, due mainly to opening the Barco line. Acquisition of prospective oil lands continued, with mostly government lands being taken. Magdalena Valley wildcatting yielded no discoveries. But a wildcat on the Barco concession yielded a small pumper.

Barco concession field activity accounted for 40 completions at Petrolea, which produced 1,400,000 barrels in the last 3½ months of 1939. There was no activity on Petrolea's south dome. At Rio de Oro three wells were completed during the year; Carbonera also completed a well.

DeMares concession activity resulted in 100 completions, all producers on the La Cira structure. The average initial was 528 barrels. Production from Infantas and La Cira fields gave the concession a yield of 22,374,151 barrels in 1939.

Drilling and Geophysical Activities in Cuba

By ROY E. DICKERSON

The Atlantic Refining Company.

Shell-Union Oil Corporation, The Atlantic Refining Company and other interests were actively engaged in wildcat drilling in 1939, and at least one new spot has been opened, that of Ruiz Williams on the concession Gilda, in the vicinity of Montembo gasoline field. Shell's efforts near San Antonio resulted in 2 failures, one of them 10,034 feet deep, though both wells had showings. Core holes drilled on Shell's Mercedes concession, south of Colon, have not yieded commercial oil. Atlantic Refining Company's 2 tests drilled during the year had showings of oil but would not produce.

Seismograph and geological work continues on the island, which is producing from 164 to 214 barrels daily.

Petroleum Development in Mexico During 1939

By V. R. GARFIAS

Cities Service Company

No tangible results of attempts to settle the controversy resulting from expropriation have developed.

The writer is one of the few who believes that a satisfactory solution should and can be attained and that every effort should be aimed toward that end rather than to keep on exacerbating the conflicting opinions.

Mexico's production in 1939 totaled 43,203,000 barrels, against 37,940,000 in 1938. Production in 1937 was 46,736,000 barrels.

Exports of crude and products has been as follows: 23,065,000 barrels in 1937; 13,933,000 barrels in 1938; and 18,113,000 barrels in 1939.

Domestic consumption of petroleum and related fuels has been as follows: 21,590,000 barrels in 1937; 18,000,000 barrels in 1938; and 18,600,000 barrels in 1939.

Mexican Petroleum Developments in 1939

By T. R. ARMSTRONG

Standard Oil Company of New Jersey.

Mexico's production in 1939 amounted to 42,479,000 barrels, 96 percent of which was controlled by the government. There were 24 completions, including 14 producers and 10 failures, in 1939, compared with 34 in 1938 and 57 in 1937.

The Northern District (Panuco) accounted for 3 producers and 5 failures; Poza Rica accounted for 5 producers and 2 failures; the Isthmus of Tehuantepec completed 6 producers and 2 failures.

Exports to Germany accounted for 33.3 percent of the 1939 total, the oil going on a 40 percent cash, 60 percent barter basis. All shipments to Italy were on a straight barter basis. Of the 3,687,000 barrels shipped to the United States for re-export Italy got about half. The last cargo of Panuco crude sold in 1939 went for 68 cents per barrel, and at the end of the year Poza Rica crude was bringing from 70 to 95 cents per barrel, while Southern District crude was going for 55 cents.

Petroleum Developments in Peru During 1939

By O. B. HOPKINS

Chief Geologist, Imperial Oil, Limited, Toronto

Peru's production was 13,496,880 barrels in 1939 against 15,838,605 barrels in 1938. Last year's production was divided as follows: Zorritos, 40,000 barrels; Lobitos, 2,650,000 barrels; La Brea-Parinas, 10,806,880 barrels.

The latter field completed 73 wells during the year as compared with 65 during 1938.

With the exception of activities of Blue Goose Oil Company in Eastern Peru, exploratory efforts were on the whole without noteworthy developments. On the Blue Goose holdings, however, a well was completed for 750 barrels of 45-gravity Cretaceous oil at 1174 feet.

Approximately 278,000 hectares of leases have been applied for in Eastern Peru in the form of 16 concessions.

Oil and Gas Production in Poland

By DR. E. JABLONSKI

The long decline in Polish production which was checked in 1938 continued upward the first half of 1939, during which time Gorlice Pipinki, the country's most promising field, got a major southern extension.

As of June 30 there were 21 active wildcats, of which 14 were in the Carpathians and 7 in the Carpathian Foreland, where exploratory drilling recently uncovered Opary gas field.

In the split up of oil fields following invasion of the country by two armies, Russia got three fourths of the production, but it was the older, declining type. The one fourth taken by Germany comprises the areas with upward production trends and those more likely to develop new fields.

Poland's production in 1938 was 136,450 metric tons. That for the first half of 1939 was 76,406 tons.

Illinois A. P. I. to meet at Mt. Vernon, February 23

The Illinois Basin Chapter, American Petroleum Institute, will hold its third regular meeting at the Emmerson Hotel, Mt. Vernon, Illinois, on Friday, February 23. A dinner at 6:30 p.m. will precede the meeting, scheduled to start at 8 p.m.

Paul F. Lewis, E. I. du Pont de Nemours & Company, will discuss "Recent Developments in Oil-Well Shooting," and N. B. Sargent, The Sargent Engineering Company, will speak on "The Performance of Sub-Surface Pumps."

Officers of the chapter, which perfected its organization recently, are William A. Watkins, Carter Oil Company, Mattoon, chairman; Bart DeLaat, The Pure Oil Company, Olney, first vice chairman; Jake Haas, Adams Oil & Gas Company, Centralia, second vice chairman, and Verner Jones, Magnolia Petroleum Company, Mattoon, secretary-treasurer.

Members of the advisory committee are C. C. Carroll, Ohio Oil Company, Marshall; A. F. Lager, Siosi Oil Company, Terre Haute, Indiana; R. W. McIlvain, Jr., The Pure Oil Company, Fort Worth, Texas; E. J. Reading, Sun Oil Company, Evansville, Indiana; T. B. Steele, Kewanee Oil Company, Robinson, and Frank Wilson, Sohio Oil Company, Mt. Vernon, all elected for one year, and Dr. A. H. Bell, State Geological Survey, Urbana; A. E. Chester, Magnolia Petroleum Company, Salem; W. S. Crowin, Tide Water Associated Oil Company, Robinson; W. C. Kneale, The Texas Company, Salem; Alex McCandless, Mahutska Oil Company, Robinson, and E. G. Robinson, Shell Oil Company, Centralia.

January exports decline in value from December

January exports of petroleum and its products showed a reduction in value from December and, while somewhat above those of January, 1939, were under the total for the same month in 1938, it was reported by the United States Department of Commerce February 15.

Shipments for the month, according to preliminary figures, had a value of $29,342,000, compared with $35,417,000 in December, $26,002,000 in January, 1939, and $30,434,000 in January, 1938.

The preliminarry report gave value of crude shipments at $5,805,000, compared with $6,112,000 in December, and $5,815,000 in January of last year. In January, 1938, however, crude shipments were valued at $8,748,000.

HIGHLIGHTS IN THE WEEK'S NEWS

Allowables

Texas commission studies operators' complaints

Concern over mounting Texas allowables and the complaints of operators was expressed by members of the Texas Railroad Commission at a statewide hearing in Austin Friday.

Commission Chairman Lon Smith declared the commission had been advised that it could not rescind its February order and reinstate its January order and still comply with the law. He had, however, received some 300 complaints including several threatening his political execution.

Commissioner Jerry Sadler pointed out that the current Texas allowable of 1,431,060 barrels daily is 59,660 barrels in excess of consumer demand as estimated by the United States Bureau of Mines. Even though Texas consistently produces 3 percent less than the allowables assigned, it is still 20,000 barrels above the estimate, he said. Meanwhile, operators have continued to complain.

"Obviously, we can't let the operators produce as much in seven days as they did in four and a half," Sadler said. "We are trying to get back for Texas some of the market that the Bureau of Mines has given to Illinois and other states, but the oil operators are impatient with the commission.

"I am not afraid of the political threats because there were only three oil men for me when I ran last time. It just narrows down to this, whether you want the Railroad Commission or Ickes to handle the oil business in Texas."

Although the commission had called for a report from refiners on their stocks, the detailed figures were not available after the hearing. Those refiners who had not mailed in answers to a questionnaire sent out by the commission filed their reports at the hearing, but none were read, nor were any company officials questioned on these matters.

Most of the hearing was given over to complaints from operators concerning conditions in particular fields. The chief source of complaints was from those who had obtained increases for their fields as a result of special hearings held in December or January, and then found allowables cut in the February order although no additional evidence had been put on.

Apparently, in making allowable adjustments to conform to estimates of the Bureau of Mines, the commission had to some extent disregarded special demands from particular fields, and had more or less levelled all fields producing the same grade of oil.

Thus, royalty owners from Sugar Land complained because they had an allowable of only 97 barrels per well, while those from Anahuac with only 20 barrels per well complained likewise.

The commissioners indicated an effort would be made to adjust differences when the March proration order is issued. Commissioner Thompson was absent because of illness. It was the second statewide proration hearing he had missed since being appointed to the commission in 1932.

Texas commission to abide by February proration order

The Texas Railroad Commission last week announced it would not rescind its February proration order and reinstate the January order as had been considered the week before. Commission Chairman Lon Smith, in a prepared statement, declared the commission would confine its activities to correcting discrimination and adjusting inequalities.

Meanwhile, Attorney General Gerald Mann advised the commission that it could rescind its orders at any time and enter emergency orders which are good for 15 days.

In an order modifying a portion of the February order, the commission provided for an allowable of 9101 barrels a day for the Gulf-McElroy field, making it retroactive to February 1. The McElroy Ranch Company simultaneously dismissed a suit brought in federal court at Austin seeking to enjoin the commission's February proration order.

To ask prosecution for disregard for February order

Texas Railroad Commissioner Jerry Sadler announced last week he will ask for prosecution of operators in state fields who produced during February at the higher rate provided in January proration schedules. It was reported to the commission that several operators had followed this policy after announcement by Commissioner Lon Smith early in the month that the order would be rescinded.

Sadler insisted that these operators had no legal right to proceed in this manner, and he declared that, regardless of any information they may have obtained privately from members of the commission, no order had been issued and he felt that prosecution was just.

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Courts

Start trial of three suits attacking East Texas order

Trial of three suits involving the East Texas proration order was begun last week before a three-judge federal court at Austin. Judges Frank Sibley, of Atlanta, James V. Allred, of Houston, and R. J. McMillan, of San Antonio, constituted the court. Illness prevented attendance of Judge Holmes, of Yazoo, Mississippi, who had been named to the court originally.

The three suits combined for the trial were brought against the Texas Railroad Commission by Humble Oil & Refining Company, Rowan & Nichols Oil Company, and F. W. Fischer. The interests of these parties varied widely, and it is possible that a decision in the case may express the holding of the court on every necessary phase of the law.

Counsel for Humble Oil & Refining Company contended that the company has in place in the field 14.3 percent of the total reserve. Under commission orders, it now gets a little more than 11 percent of the field allowable. The suit seeks to require the commission to give the company an allowable in closer proportion to its share of the reserve.

Rowan & Nichols sought an increase for its Todd "A" lease, based on the reserve in place. A case tried last year involved the company's Todd "B" tract. In a general way, the Humble Oil & Refining Company and Rowan and Nichols suits asked for the same thing.

F. W. Fischer, however, has 49 wells on some 30 acres, and counsel insisted his wells could produce far more than the 20 barrels now assigned to them without causing waste. Testimony was presented to show that potentials of the wells are in excess of 800 barrels per hour on the av-

erage. It was contended that the small allowable assigned was out of proportion to capacity of the wells to produce.

In opposing the suits, the commission declared it was impossible to estimate reserves exactly or to divide the oil accurately. Counsel contended that the order now in effect distributes the oil as fairly as possible without confiscating property.

Although wells in the field receive a minimum allowable of 20 barrels, exclusive of marginal producers unable to make that amount, actual production averages between 12 and 13 or 14 barrels daily because of shutdowns.

Meanwhile, Commissioner Jerry Sadler announced that he would recommend that, effective March 1, the commission enter an order placing East Texas wells on production for 7 days in each week.

Testimony introduced by both sides followed that offered in other suits on East Texas. Much of it was devoted to comparative drilling densities or properties, comparative sand thicknesses and pressures, and to a study of estimates of oil in place made by various engineers.

Court overrules demurrers in Pacific Coast trust case

Demurrers filed on behalf of two associations and a group of oil company defendants in the government's Pacific Coast anti-trust prosecution were dismissed last week by Federal Judge Paul J. McCormick at Los Angeles following verbal argument.

The court, in a ruling from the bench, said that actions of the defendants charged with artificially maintaining gasoline prices may have been harmless, but that the indictments contained sufficient charges to sustain them. The demurrers were filed by counsel for the Fair Practices Association, Independent Refiners' Association and 21 oil companies.

Counsel for defendant companies will argue motions seeking bills of particulars on March 12.

Commission to study North Texas spacing rules

Special spacing rules for shallow wells in North Texas will be considered at a hearing scheduled by the Texas Railroad Commission for February 19 at Wichita Falls. This is the first application for a special rule set for hearing since the commission's 20-acre spacing rule became effective on February 1.

Most of the shallow areas in North Texas have been developed on the old rule which allowed wells to be drilled 150 feet from lease lines and 300 feet apart. Applicants for the hearing pointed out that this condition made it necessary to continue development on that basis.

It is possible that a special hearing for deep well spacing will be necessary also. Commission rules have long provided that wells drilled to horizons below 2000 feet in the North Texas district should be drilled on a 10-acre basis. The new order providing 20 acres excepts those fields where a different special rule has been entered in the past. However, because the North Texas rule applies not to a "field," but to an entire "district," there is some doubt as to its status with relation to the new rule.

Control

Compact and industry to attack control bill

A sharp attack on the constitutionality of the administration bill providing for Federal control of oil production will be launched February 19, when the Cole subcommittee of the House committee on interstate and foreign commerce opens its final hearings on the measure. Representatives of the Interstate Oil Compact Commission and the industry will be heard.

The attack will be initiated by Texas Railroad Commissioner Ernest O. Thompson, former chairman of the compact commission, with submission of a lengthy brief prepared on behalf of the commission.

The brief contends that Congress has no constitutional authority to control production of oil within the boundaries of the several states under its power either to provide for the national defense or to regulate interstate and foreign commerce.

Citing a long list of court decisions, the commission brief asserted "it has been proven beyond doubt that the federal government has no constitutional authority to control the production of petroleum, either under the claimed necessity of providing for the national defense, or under the guise of regulating interstate and foreign commerce."

So far as national defense is concerned, it was suggested, Congress has a remedy available by conserving the oil in lands already owned by the United States and by purchasing oil-bearing lands from others.

"Congress has ample power under the Constitution to make appropriations for the purchase of oil-bearing lands," it was declared. "Section 8 (1), Article I, quite clearly and definitely gives Congress the power to lay and collect taxes for the purpose of providing for the common defense, and if Congress, in its good judgment, believes that the purchase of petroleum-bearing lands is necessary for the common defense, it has full power to appropriate for such purchases.

"And if for any reason the owner of oil-bearing lands will not voluntarily cede, the United States government has the power to assert its undoubted right of eminent domain—subject to reasonable compensation to the owner, of course.

"There are many areas in the various oil-producing states that have not as yet been developed for oil and gas but which are potentially productive thereof and which could be acquired by the federal government at very reasonable cost. Many of these lands are along the tidewaters of the respective states. By the acquirement of such areas, as well as other lands, and the proper conserving of the oil in the lands it already owns, the United States government can adequately meet its petroleum requirements."

The brief contended that the bill seeks to regulate the natural deposits of oil and gas in the ground which, in Texas and many other states, are real estate, real property, and expressed doubt as to the ability of Congress to declare such "real estate" as engaged in "interstate commerce."

"The oil and gas in place cannot be commerce nor even begin to be in commerce until severance from the ground is had—until the petroleum is brought out of the ground through the well, at which time and only at such time, does it cease to be real property and change its legal status from real estate to personal property," it was declared. "And this bill deals only with the petroleum in the ground; it has no application to the oil and gas after they leave the hole, after severance from the ground."

Enough for 7769 Years

Dana Hogan, president of the San Joaquin Valley Oil Producers Association, Bakersfield, California, has filed a statement with the committee giving figures on future supplies, in which he says:

"You will note in my statement before the Cole committee that I mentioned an average present cost of 18 cents a gallon for gasoline made from coal. This average figure was obtained from the testimony of the government witness, Arno C. Fieldner, before the committee in November, 1939, wherein he stated that the costs per gallon range from 16 to 19 cents per gallon. I have since been reliably informed that Standard Oil Company of New Jersey has lowered this cost to 12 cents a gallon. This now makes coal an oil reserve for all practical purposes.

"Fieldner stated that from 47 to 65 percent of crude oil by weight can be now obtained from a ton of coal. Using an average figure of 50 percent recovery would give us ½ ton of oil from each ton of coal. Three barrels of 20-gravity oil weigh almost ½ of a ton. Thus we can obtain 3 barrels of oil from a ton of coal. The United States Geological Survey estimates our coal reserves at 3200 billion tons. Multiplying this by three gives us 9600 billion barrels of oil and still leaves 1600 billion tons of residuum and coke of practically the same calorific value as coal and can be used as coal, enough to take care of our entire coal consumptive needs of ½ billion tons annually, for 3200 years.

"Adding the 9600 billion barrels of oil from coal to the estimated 92 billion barrels of oil from our oil shales and the new January 1, 1940, reserves figure of 19,600,000,000 barrels of petroleum we have a grand total of 9,711.6 billion barrels of oil, enough to take care of our entire consumptive needs of 1¼ billion barrels annually for 7769 years.

"Fieldner further stated that between 4 and 5 tons of coal will produce 1 ton of gasoline, thus 1 ton of coal will make conservatively 1/5 ton or 400 pounds of gasoline. This would be 1-3/5 barrels by weight of 65-gravity gasoline that can be made from 1 ton of coal. Multiplying this 1-3/5 barrels by 3200 billion tons of coal and we have 5120 billion barrels of gasoline alone. To this huge figure add 49 billion barrels, same being 44 percent (the today average percentage of gasoline obtained from a barrel of U. S. oil) of 111.6 billion barrels composed of 92 billion barrels of oil shales reserves and 19.6 billion barrels of crude oil reserves. This is enough to take care of our en-

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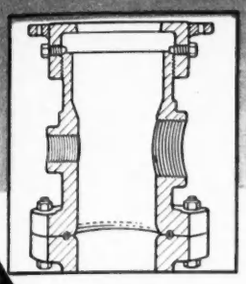
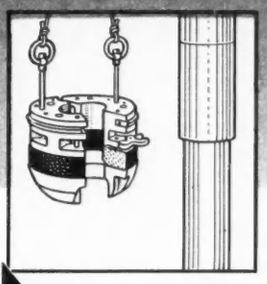
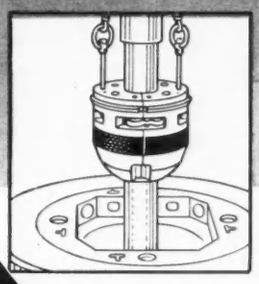


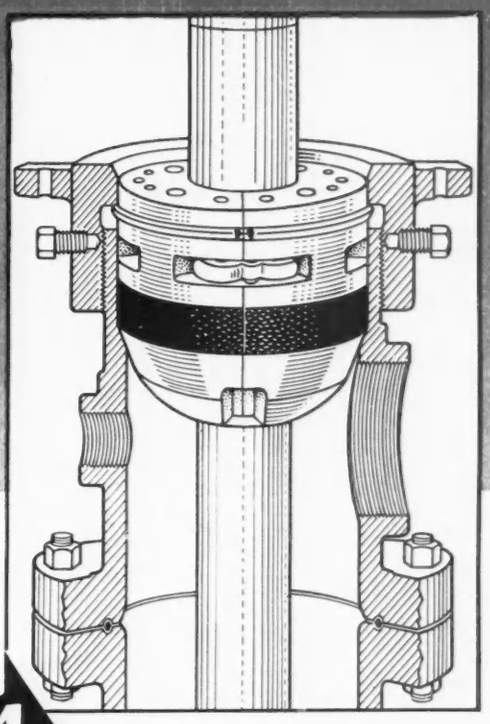
1 *The body is installed on the casing or above other control equipment. The set screws in the lip ring position it so that there is correct clearance for the lock rings of the packing assembly.*



2 *The packing assembly is hung from a line in the derrick, convenient for instant use. The blowout preventer body is empty during all operations, and the flow lines may be connected to the side outlets, thus saving a mud cross.*



3 *To pack off, the hinged and latched packing assembly is swung into position around the drill pipe or kelly, where it automatically locks in a closed position, and is then lowered into the body.*



4 *When lowered into the body, the packing assembly is automatically locked in position by the lock rings which project under the lip ring. An instant seal is made by allowing the weight of the string to rest upon the packing assembly, as shown; or by raising the pipe until the packing is compressed by contact with a tool joint or coupling below the packing assembly. To maintain the seal, the lip ring is screwed down against the packing assembly, after which the pipe may be rotated and raised or lowered between couplings. Well pressure against the under side of the packing assembly assists in maintaining a safe, secure packoff.*

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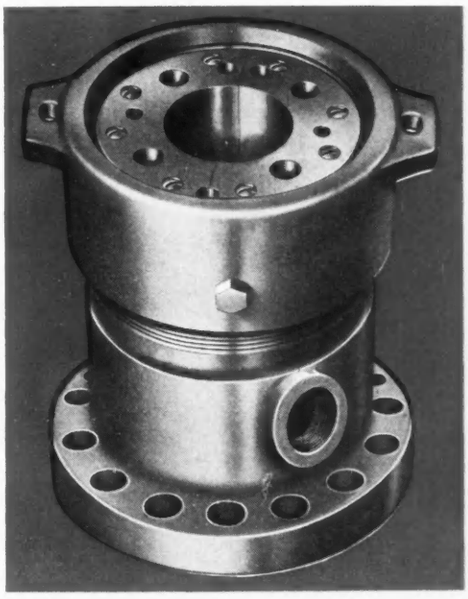
Through years of use, the Baash-Ross Blowout Preventer has proved to be the simplest and most positive means of packing off the drill pipe or kelly against pressure. Because the packing assembly is in place only when it is needed, it is not subjected to wear or damage, and can be depended upon for efficient operation at all times. The Baash-Ross Blowout Preventer is an indispensable part of *complete* blowout prevention and pressure control equipment, and can be used independently or in combination with ram or pressure-operated blowout preventers and other control devices. For maximum safety under any emergency, a Baash-Ross Blowout Preventer should be installed above other control equipment in order to provide a positive secondary seal that can be maintained indefinitely to keep the well under control.



Baash-Ross Blowout Preventer with packing assembly in place. Bodies with male or female thread, and with flanged side outlets are also available.

See pages 176 and 177 of your 1940 Composite Catalog for complete description, range of sizes, dimensional data, and other types of packing assemblies.

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tire consumptive needs of 500,000,000 barrels annually, for 10,240 years.

"Our large Alaskan coal reserves are not used in my figures but they will probably more than offset that portion of our present coal reserves not recovered through mining losses or left in the ground.

"I also do not take in my figures of oil reserves the natural gas reserves which are equivalent in calorific value to 3 billion tons of anthracite coal. How much gasoline can be produced from our natural gas reserves by the absorption, catalytic, and alkalization methods is something that can be determined by governmental inquiry of the oil refining and natural gas companies."

At a meeting of the executive and legislative committees of the National Association of Railroad and Utility Commissioners in Washington last week a resolution submitted by Chairman Lon Smith of Texas Railroad Commission, a member of the executive committee, was adopted, instructing the committee on legislation and John E. Benton, general solicitor of the association, to "do everything within their power to resist passage of the Cole oil bill."

Representatives of the Interstate Oil Compact Commission will be the first to testify before the subcommittee in its final hearings. Due to have been heard during the week of February 5, when state representatives testified, so much time was taken by the governors and other officials of the oil states opposing the bill that it was necessary to postpone the appearance of the compact members. Thompson is expected to be the chief witness, with indications that members of the subcommittee will hammer him with questions as to the real underlying purpose of the production shutdown of last August.

Nearly a score of witnesses will be presented by the industry to express its opposition to the proposed legislation, with the American Petroleum Institute, the Independent Petroleum Association of America, and other production and marketing organizations lining up solidly against the bill.

Meanwhile, indications began to make their appearance in Washington that the subcommitte will make a report to the full committee recommending that no action be taken with respect to the legislation this year, but that the state regulatory bodies and the industry be given an opportunity to "clean house."

The report is expected to show that waste in production has been proven to exist and that the states, in some respects, have been derelict in attempting to deal with the situation and have, for the most part, concerned themselves seriously with the problem only since introduction of the control bill last year.

However, it is believed, the subcommittee will hold that the situation can be dealt with adequately if the states and the industry exert themselves sufficiently and that they should be given an opportunity to do this, with the cooperation of the federal agencies interested in the subject.

Washington

Navy also seeks underwater oil reserves on Gulf Coast

Navy Department efforts to gain possession of the California off-shore oil fields are but the preliminary step toward assertion of the federal government's title to the underwater oil reserves of the Gulf Coast area, it was admitted by the department last week.

Disclosure of the department's plans was made before the House appropriations committee during hearings on the navy supply bill for 1941 by R. G. Tracie, assistant to Rear Admiral H. A. Stuart, director of the naval petroleum reserves, in answer to questions by members of the committee.

"Do you have any naval oil reserve under water anywhere," Tracie was asked by Representative Charles A. Plumley.

"No," he replied. "We hope to get some."

"How do you hope to get them?" Representative James G. Scrugham asked.

"Through some such action as Senator Nye's resolution and Congressman Hobbs' resolution introduced last year, which were heard before the Senate committee on public lands and surveys and the House judiciary committee," the witness explained. "These resolutions had for their purposes the setting aside as a naval petroleum reserve such oil pools as may be found beyond the line of low tide and within the three-mile limit off the coast of California."

"Would that apply to the salt domes off the coast of Texas and Louisiana as well?" Congressman Scrugham inquired.

"It probably would, in the long run," Tracie said. "The test was to be made in California, to determine whether the Government of the United States owned the minerals in the soil beneath the submerged lands, inside the three-mile limit, or whether such mineral deposits are rightly in the possession of, and the property of, the state."

The committee went more deeply into the question of underwater oil reserves during its consideration of proposals to extend the boundaries of the United States beyond the three-mile limit to the 100-fathom point at the edge of the continental shelf or even to the 1000-fathom curve, as more logical defense limits under modern conditions.

Testifying as to the desirability of broadening the protective zone along the coasts, Dr. F. W. Lee, chief of the geophysical section of the United States Geological Survey, told the committee that highly valuable mineral deposits lie between the shore line and the edge of the continental shelf, "notably off the coast of Louisiana where they have salt domes."

"The salt domes have an average value of about $25,000,000 and they are scattered more or less regularly along the Texas and Louisiana coast and also into the continental shelf," Dr. Lee explained.

"Just exactly how many hundreds of millions of barrels of oil would be there at the present moment cannot be definitely stated. A careful study of the salt domes along the Louisiana and Texas coasts will show that salt domes are found off the shore and therefore this salt-dome region extends into the continental shelf.

"To say in advance how much oil we would find there would be quite out of the question," he told the committee. "In certain places salt domes having oil deposits have been found there, and if they extend out to the same degree from the shore line they extend inside of the shore line there may be as many salt domes beneath the continental shelf as there are along the Louisiana and Texas coast.

"Now, the salt domes far from the coast in those states do not carry oil, but the ones along the coast line extending into the continental shelf are the ones that have production. Members of the technical staffs of, for example, the Gulf Oil Company, the Standard Oil Company, as well as The Texas Company, have made seismic surveys of the depths of the salt domes and have also contoured the boundary of them, and recently they have gone so far as to be able to put gravity-measuring devices on the floor of the sea for measuring salt domes buried in the continental shelf."

Navy's move to consolidate reserve holdings stopped

Refusal of the Budget Bureau and the House appropriations committee to provide funds declared by naval officials to be urgently needed was seen last week as preventing the Navy Department from taking any steps toward the consolidation of lands owned by Standard Oil Company of California in Naval Petroleum Reserve No. 1.

Reporting the naval supply bill for 1941 on February 13, the committee disclosed that it had rejected an appeal of the department for authority to employ a consulting petroleum engineer at not to exceed $50 per day, for which a fund of $9000 was desired, on the ground that, in addition to its own personnel the department can secure the services of trained experts from the United States Bureau of Mines and other agencies without cost to it.

It was disclosed also that the Budget Bureau had rejected an application for $195,000, sought to make a valuation of the lands of private parties in the naval reserves.

During hearings on the bill, the committee was informed by R. G. Tracie, assistant to Rear Admiral H. A. Stuart, director of the naval petroleum reserves, that the $204,000 asked for valuation purposes and the employment of an engineer was to be used to bring about the consolidation of the government's holdings in Naval Reserve No. 1.

"We want to acquire this land," Tracie explained. "It is a threat to the destruction of a large area of the reserve; and if the company develops its lands it is probable that the oil in the reserve will be depleted by at least one third, or more. In other words, by developing one section, the company can destroy four sections of government land.

"Our thought has been that we could trade land with them. In other words, the company owns land outside the reserve, practically surrounding it. The

A QUIET DRILLER "OPENS UP" ON EXCELLAY

FROM THE DAILY REPORT OF A TIGER BRAND WIRE LINE ENGINEER

Two weeks ago, they switched over to Excellay rotary lines on this rig. Today I asked the morning-tour driller about the new lines.

He's usually a quiet fellow --hard to open up. But you should have heard him spout on Excellay!

"Best lines we've ever used," he said. "They run smooth and fast—never cause a minute's delay. There hasn't been any trouble from twisting."

There was a lot more, but you get the general idea. He couldn't find words enough to say all he wanted. It's things like this, Chief, that make me feel proud to handle Excellay.

Yours, *Bob*

ALWAYS on the job, checking performance, are the American Tiger Brand Wire Line Engineers. These men spend most of their time right out in the field seeing you and thousands of other operators put wire lines through the paces. That's how they know so well what kind of punishment wire lines have to stand — and how to help you get the greatest possible safe performance out of every dollar you invest in wire lines.

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Write us for complete information —and ask for one of our engineers to call and check over your lines.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY
San Francisco

United States Steel Export Company, New York

EXCELLAY *Preformed* **WIRE LINES**

UNITED STATES STEEL

Tulsa Chapter of the American Welding Society sponsored a five-day instruction course, February 5-9, for welding engineers and designers at the College of Petroleum Engineering, University of Tulsa. E. W. P. Smith, chief consulting engineer of The Lincoln Electric Company, Cleveland, Ohio, was in charge of the lectures and demonstrations. Over 25 oil companies and service companies were represented at this course.

Standard Oil Company acquired these lands when the old Standard Oil Company was consolidated with the Pacific Oil Company, which was a subsidiary of the Southern Pacific Railroad, to form the present Standard Oil Company of California.

"We would like to do one of three things, either purchase, condemn or trade lands so that the company's lands inside the reserves would be consolidated with their lands outside the reserve. But until we have an answer to the question 'what are the lands worth?' we cannot go to the President for approval of any of these things."

Tracie said that the $195,000 sought was to be used to drill a few scattered wells to delineate and determine the oil content of that part of the field which is checker-boarded with private land.

"The story is that until we do something to show the values, the Standard Oil Company will not cooperate, or negotiate with us at all," he said. "They have taken the stand that we will never get the money to prove the values, and therefore we will be estopped from going into court, because the expert testimony and all the evidence will be on their side; or from determining what would be an equitable exchange."

Move to halt oil use in trade concessions may fail

Amendment of the Reciprocal Trade Agreements Act to prohibit the use of the excise taxes on oil, coal, copper and lumber as concessions in reciprocal trade agreements will be pressed on the floor of the House this week by Representative Wesley E. Disney, of Oklahoma, when the measure is brought up for consideration. There is little expectation, however, that the move will be successful.

Congressman Disney himself last week admitted hopelessness of the effort unless interested members of the industry can enlist the support of a large number of members from other states.

In informed circles it is predicted that the legislation extending the Reciprocal Trade Agreements Act, now due to expire June 12, next, will be adopted by both House and Senate without any amendments tying the hands of the President. The sentiment for the administration was demonstrated in a vote of 11 to 14 by which the House Ways and Means Committee refused to incorporate Representative Disney's amendment in the extension bill. The vote was strictly along party lines, with not one Democratic member of the committee supporting the amendment.

The House is tentatively scheduled to take the bill up for passage on February 19.

Missouri minerals conference at Rolla on April 26-27

Dr. H. A. Buehler, head of the Missouri Geological Survey, and Dr. Wm. R. Chedsey, director of the School of Mines and Metallurgy at Rolla, Missouri, who attended a meeting of the program committee of the Missouri Mineral Industries Conference, held in the office of John Prince, president of the conference, in Kansas City announce that there will be a meeting of the conference held in Rolla on April 26 and 27.

On the morning of April 26, officials of the Geological Survey, the School of Mines and Metallurgy, and the United States Bureau of Mines station will outline their research activities during the past year. On the afternoon of April 26 there will be a symposium on Missouri coal, its uses and distribution. On the morning of April 27 there will be a discussion of the oil and gas developments in Missouri and other mineral resources of the state. A business meeting will conclude the program.

On the night of April 26 there will be a joint meeting with the St. Louis section of the American Institute of Mining and Metallurgical Engineers.

Texas Recycling permits

The Texas Railroad Commission has entered orders allowing Trinity Gas Corporation to operate a recycling plant in the Grapeland field, Houston County.

Stag dinner to feature A.P.I. spring meeting

A stag dinner for delegates to the annual spring meeting of the American Petroleum Institute to be held March 14 will highlight the entertainment program for the two-day convention scheduled by the Mid-Continent Section of the Division of Production, according to R. E. "Dick" Adams, publicity chairman, Cities Service Oil Company.

The annual convention dinner will be held on the closing evening, March 15.

H. W. Cardwell, Wichita, Cardwell Manufacturing Company, chairman of the entertainment committee, is sparing no effort to make the stag dinner a real success. Assisting him are H. E. Zoller, Wichita, Derby Oil Company; Walter Kuhn, Wichita, independent producer; Ernie J. Shaffer, Hutchinson, independent drilling contractor; Max M. Mahaffey, Oil Hill, Cities Service Oil Company; Harland Cardwell, Jr., Wichita, Cardwell Manufacturing Company; S. F. Greeley, Wichita, Lone Star Cement Company; C. A. Black, Wichita, Bovaird Supply Company; C. A. Daniels, Amarillo, Phillips Petroleum Company; Jack A. Vickers, Wichita, Vickers Petroleum Company; George Hoisington, Wichita, Halliburton Oil Well Cementing Company; J. F. O'Shaughnessy, Lario Oil & Gas Company; Lee Phillips, Wichita, independent producer, and W. H. Reardon, Greenwich, Shell Oil Company, Inc.

Illinois crude going to Wisconsin refinery

Construction will be started in early March on a 6000-barrel cracking-type refinery at Sheboygan, Wisconsin, first for the state, with Illinois designated as the crude oil supply source, according to Dewey E. Foster, formerly of Alma, Michigan.

Foster, who brought about organization of Wisconsin Oil & Refining Company, which will build the plant, said contracts had been closed for the cracking unit.

Two oil and one pipe line firm chartered in Texas

Two Texas oil companies and one pipe line firm were among corporations granted state charters last week.

Vega Oil Company, Houston, was charter by L. E. Scherck, Jeanne Morris and Sidney A. Judson, and West Conroe Oil Corporation, Conroe, was organized by Dr. T. S. Falvey, E. A. Qualline and R. E. Hanrick.

Arden Oil Corporation was organized as a pipe line firm by Otto Craft, B. C. Owen and Lloyd George.

Michigan rig builders return to work

The Mt. Pleasant, Michigan, local of the union of Oil Field Workers of America, representing rig and derrick builders, voted to go back to work on February 8 after a 7-day sit-down. The vote to return to work followed continued refusal of 7 of 9 contractors, with whom the union was negotiating, to either increase wage scales or sign a union agreement.

MEN IN THE INDUSTRY'S NEWS

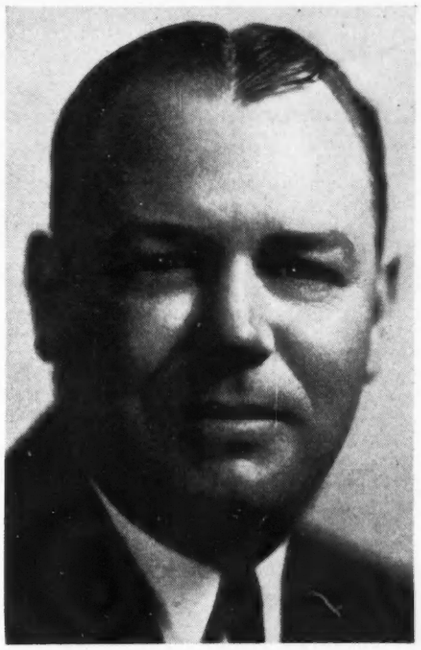
LONE STAR GAS COMPANY ADVANCES D. A. HULCY TO PRESIDENCY; ELMER F. SCHMIDT NAMED VICE PRESIDENT

ADVANCEMENTS FILL VACANCY CAUSED BY DEATH OF L. B. DENNING

D. A. HULCY, executive vice president of Lone Star Gas Corporation, was elected president February 12, succeeding L. B. Denning, who died February 6. The board of directors also elected Elmer F. Schmidt, operating manager of Lone Star Gas Company and Lone Star Gasoline Company, both subsidiary units, a vice president. The Lone Star System is one of the largest natural gas concerns in the United States, with an extensive trunk line system in Texas and Oklahoma. General offices are at Dallas.

Hulcy is a native of Franklin, Texas. Upon completion of his education, he worked for railroads at Palestine and Rusk, Texas, from 1912 to 1919. Having specialized in accounting work, he moved to Dallas in 1920 to enter the the accounting department of Lone Star Gas Company. Within 4 years he was appointed chief clerk, then in 1927 became assistant comptroller. Recognition of his executive ability was given in November, 1929, when he was made assistant to the president. In 1935 he was elected a vice president and director of Lone Star Gas Corporation, and a little later was advanced to executive vice president.

Schmidt has been with the company since 1918, having been engaged to organize the gas measurement department. A year later he was appointed chief engineer. His promotion to general superintendent in 1920 preceded the expansion of the company's natural gas transportation activities into a major system. He was elected vice president in 1936, and in June, 1939, succeeded Frank L. Chase, retired, as operating manager.



D. A. HULCY

ELMER F. SCHMIDT

R. L. BLAFFER and H. C. Weiss were re-elected board chairman and president, respectively, of Humble Oil & Refining Company when the firm held its annual meeting in Houston last week. Also named were E. E. Townes, vice president and general counsel; James Anderson, John R. Suman and L. T. Barrow, vice presidents; R. E. Seagler, general attorney; James S. Crate, secretary and assistant treasurer; H. Millsapps, M. B. Fox and Charles E. Kugler, assistant secretaries; L. H. Attwell, Jr., comptroller; Paul Millsapps, assistant treasurer; George R. Cooke, assistant secretary and assistant treasurer; O. F. Carroll, assistant treasurer; R. C. Huder, cashier; B. P. Barrett, Jr., and T. C. Brunson, assistant cashiers.

TOM WREN, pioneer South Texas oil operator, is in the P. & S. hospital in San Antonio.

GEORGE R. PINKLEY, San Antonio geologist, has returned from an extended tour of the Mississsippi area.

Tide Water Associated Oil Company last week announced promotion of five executives.

BERT I. GRAVES, vice president of Tide Water Associated Oil Company for the past 10 years, has been named chairman of the operating committee for the company's Eastern division. He will transfer from San Francisco to the company's headquarters in New York.

GEORGE J. HANKS has been named vice chairman of the Eastern division operating committee, and will continue as vice president in charge of transportation and supplies for the division.

L. D. JURS, vice president in charge of transportation and supplies for the Western division, has been named vice chairman of the division's operating committee.

HAROLD F. PARSONS, assistant to the executive vice president for 10 years, has been named assistant vice president and manager of the New York crude and products department.

GEORGE J. MURRAY, JR., assistant to the company's president for 10 years, has been appointed to a newly-created post of manager of public relations.

A. E. CHESTER, Illinois division superintendent of production for Magnolia Petroleum Company, with headquarters at Salem, accompanied the body of his wife, who died February 7 at a Centralia hospital, to Gatesville, Texas, for final services and burial.

Humble Oil & Refining Company has announced several changes in the supervisory forces of its production department.

L. D. WEBSTER, Southwest Texas division petroleum engineer, has been promoted to division petroleum engineer.

J. M. MILLER, Heyser district petroleum engineer, has been promoted to assistant division petroleum engineer.

H. P. ELWOOD, gasoline plant superintendent, Raccoon Bend, has been transferred to the Dickinson gas plant as superintendent in charge.

J. A. LEE, gas plant superintendent at Heyser, has been transferred to the Conroe gas plant as superintendent.

W. J. McDOUGAL, gas plant superintendent at Conroe, has been transferred to the Heyser gasoline plant as superintend-

E. O. BUCK, consulting petroleum engineer, discussed economic problems in recycling an oil field before a recent meeting of the Petroleum Engineering Club of Texas A. & M. College.

HAROLD DENTON, Sun Oil Company, will discuss "Abnormal Salt Water Pressures in the Gulf Coast" before the Houston chapter of American Petroleum Institute January 19. Jack Logan, associate editor of THE OIL WEEKLY, will speak on "Oil Prospects for 1940."

FRED W. BATES, consulting geologist, will speak on "The Geology of the Eola Field" before the South Louisiana Geological Society February 20 at Lake Charles.

T. E. SWIGART, vice president of Shell Oil Company, Inc., and O. D. Crites, head of the company's crude oil purchasing department, have been named colonels on the staff of Governor John E. Miles of New Mexico.

L. E. HESS of Oil City, Pennsylvania, graduate petroleum engineer of the University of Pittsburgh, and Charles H. Hudson, graduate engineer of Texas A. & M. College and a native of Laredo, Texas, sailed from New York last week for duty in South America. Both received extensive practical training in the

production engineering department of the Magnolia Petroleum Company. Hess will be with the Socony-Vacuum Oil Company, Inc., in Venezuela, while Hudson will work for the Colombian Petroleum Company in the Barco, Colombia, district.

HOWARD C. PYLE, former production engineer for Union Oil Company, has been appointed assistant chief petroleum engineer, according to W. S. Eggleston, chief petroleum engineer for the company. Recently re-elected chairman of the American Petroleum Institute's Pacific Coast division of production, Pyle began his association with Union Oil Company on graduation from the University of California in 1927.

L. ROY CARTER, tax specialist for the Sun Oil Company, with headquarters at Dallas, has resigned effective March 1 to engage in private practice as a tax consultant. He will establish an office in the Santa Fe Building, Dallas.

H. E. HARRILL has opened a North Texas division for Harrill Drilling Company at Gainesville.

BILL CLARK, entertainment committee chairman, and Sam Dunnam, Jr., are handling arrangements for Houston Geological Society's stag dinner February 23.

H. N. K. BROOKINGS, geologist for Phillips Petroleum Company, has been transferred from Enid, Oklahoma, to Oklahoma City.

W. E. WRATHER, Dallas consulting geologist, discussed "Minerals and World Politics" before the Houston Geological Society last week.

G. J. LYNCH, Latimer Hughes and L. R. Emerson, all of Oklahoma City, last week organized the Ande Oil Company.

GEORGE MARTIN, superintendent for Barnsdall Oil Company at Okmulgee, Oklahoma, has been transferred to Victoria, Texas.

A. A. NICHOSON, personnel manager for The Texas Company, New York, discussed "Industry Must Find New Roads to Travel" before the Oklahoma City chamber of commerce last week.

TOM W. BRINKLEY, junior engineer department for Sinclair Prairie Oil Company, has been transferred from Tulsa to Troop, Texas.

DIED:

DR. HORACE T. MANN, professor of petroleum engineering at Missouri School of Mines, died February 8 of a heart ailment.

EARL L. HOWELL, 51, independent producer, died February 9 of a heart attack at his home in Dallas, Texas.

H. R. DANIELS, 35, driller, and Jack Jordan, 28, derrick man, were killed February 8 when a derrick collapsed at a test being drilled for the Aloco Oil Company in the Wasson field, West Texas. T. L. Jones, also a member of the crew, was seriously injured.

ROY BAKER, 25, employe of Humble Oil & Refining Company in the East Texas field, was killed February 11 in the crash of a private airplane near Kilgore, Texas.

C. C. HARRIS, 77, pioneer Southern California operator, died at his home in Van Nuys, following a lengthy illness.

Commemorate discovery of oil in Shackelford, West Texas

Two leading Texas independent operators shared honors with The Texas Company during an oil men's dinner at Albany last week to commemorate the discovery of oil in West Texas. The event was sponsored by the Albany chamber of commerce.

Principal speakers and honor guests were E. A. Landreth, chairman of the board of Landreth Production Corporation, and Charles F. Roeser, president of Roeser & Pendleton, Inc., both of Fort Worth. Landreth developed the Ibex pool of Shackelford County, while Roeser discovered the Cook field in the same county.

The Texas Company was presented with a bronze plaque by the Texas Mid-Continent Oil & Gas Association to commemorate the completion of the first commercial oil producer in West Texas. It was The Texas Company's J. E. Wild A-1, brought in November 9, 1913, near Moran, southeastern Shackelford County. The plaque will be mounted on a miniature steel derrick on the courthouse square at Albany.

More than 300 oil men from all parts of Texas as well as from other states took part in the event. Presided over by Joe A. Clarke, president of West Central Texas Oil & Gas Association, and J. Carter King, Jr., president of the Albany chamber of commerce, the dinner brought together many pioneers in the development of Shackelford County, first West Texas area to have commercial production.

Speakers included Landreth, who gave recollections of the early days in West Texas; Roeser, who talked on the future of the industry and the need for curtailment of over-drilling; Clarke, who welcomed the visitors; Andrew M. Howsley, Albany, who introduced visitors; George C. Gibbons, executive vice president of Texas Mid-Continent Oil & Gas Association, who presented the plaque, and H. S. Cole, Jr., West Texas division manager for The Texas Company at Fort Worth, who accepted the tablet for his company.

Among others who spoke informally were J. A. Neath, vice president of Humble Pipe Line Company, Houston; Roy B. Jones, president of Panhandle Producing & Refining Company, Wichita Falls; J. S. Bridwell, independent operator, Wichita Falls; E. A. Ungren of Ungren & Frazier, Abilene; W. A. Moncrief, vice president of Showers & Moncrief, Inc., Fort Worth; W. A. Little, superintendent for the West Texas division of The Texas Company when the Shackelford County discovery was drilled, and now of Hot Springs, New Mexico; and M. J. Adams, The Texas Company, Fort Worth.

Commemorating discovery of commercial oil in West Texas, Texas Mid-Continent Oil & Gas Association, through its executive vice president, George C. Gibbons, presented The Texas Company with a bronze plaque at the Albany chamber of commerce oil men's dinner February 12 at Albany. Shown at the left making the presentation is Gibbons, while in the center, receiving the tablet for The Texas Company, is H. S. Cole, Jr., West Texas division manager. Cole, in turn, presented it to J. Carter King, Jr., president of the Albany chamber of commerce, at the right, who will mount it on a miniature steel derrick on the Shackelford County courthouse square.

Markets generally steady and prices are unchanged

Prices of refined products were mostly unchanged during the past week, as fuel oils and lubricants continued in strong demand, while gasoline remained depressed by surplus stocks and curtailed demand, due to cold and stormy weather.

The principal development in the crude market was the increased hope in California that former postings might be restored by companies that recently reduced prices. This hope was based on the firming of the fuel oil market on the Pacific Coast.

California Situation

Meanwhile, other companies had not met the lower price schedule initiated by Standard Oil Company of California and accepted also by Richfield Oil Corporation. That reduction had ranged from 4 to 15 cents a barrel, and had been explained by Standard as necessary because of depressed prices of fuel oil.

Shell Oil Company has advanced the price of heavy fuel oil at San Pedro harbor from 75 to 90 cents a barrel, and the increase was met February 13 by Tide Water Associated Oil Company.

Gasoline Market

The gasoline market has not declined any further in the past two weeks, despite large stocks. Movement against contracts has continued normal generally, although business in the open market has been light.

Inventories of gasoline now are above 90,000,000 barrels and are moving fast toward the highest level ever reached in the past.

PRODUCT PRICES

	Range Last Week (Cents a gal.)		Changes from Week Before	
REFINED GASOLINE				
Oklahoma Refineries:				
62 octane and under	3¾	4⅛	...	...
63-66 Octane	4	4⅜	...	—⅛
67-69 Octane	4¼	4¾	...	...
70-72 Octane	4½	5	...	...
Mid-Western Tank Car:				
62 Octane and Under	3¾	4¼	...	—¼
63-66 Octane	4	4⅛	...	...
67-69 Octane	4¼	4¾	...	...
70-72 Octane	4½	5	...	...
NATURAL GASOLINE				
Grade 26-70:				
F. O. B. Group 3	2	...	...	...
F. O. B. Breckenridge, Texas	1¾	...	...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	3¾	4¼	...	...
42-44 water white	3⅞	4⅝	...	...
Mid-Western Tank Car:				
41-43 water white	3¾	4¼	...	...
42-44 water white	3⅞	4⅝	...	...
FUEL OILS				
Mid-Western Tank Car:				
Range Oil	3¾	4	...	...
Gas and Fuel Oils:				
No. 1 Prime White	3¾	3⅞	...	...
No. 1 Straw	3¾	3¾	+⅛	...
No. 2 Straw	3½	3⅝	...	...
No. 3	3⅜	3½	...	...
No. 5 (per bbl.)	65	70	...	...
No. 6 (per bbl.)	50	55	...	...

Light fuel oils continue in particularly strong demand, as cold weather has held requirements for heating at high levels. Prices asked by some refiners and resellers in the Middle West are one eighth cent a gallon higher than a week ago in some instances.

Heavy fuel oils continue to show strength outside the Pacific Coast region, as demand remains good while stocks are relatively small. Prices of those oils are steady at the prevailing improved levels.

Supplies of lubricants still are relatively scarce, as market requirements continue exceptionally large. Material sold for export has been moving out in substantial quantities, and new orders from abroad are confidently expected. Some slowing down of industrial production in the United States has tended, however, to retard movement against domestic contracts.

Larger crude runs push gasoline stocks higher

Increased crude runs in the week ended February 10 resulted in greater production of gasoline and an unusually large addition of that product to storage. But despite the accelerated runs, the refineries failed to turn out enough heating oil to meet current unusually large market demand, and it was necessary to take 854,000 barrels of gas oil and distillate out of the relatively small supplies in storage. Stocks of residual fuel oil also were drawn upon to the extent of 192,000 barrels, as industrial demand held up well.

Production and Runs

Crude oil production in the United States increased by the large amount of 189,300 barrels in the week of February 10 and was about 150,000 barrels in excess of market demand, as estimated for February by the Bureau of Mines. The output was 12.3 percent larger than in the corresponding week last year.

Crude runs to stills rose from 3,395,000 to 3,460,000 barrels daily and were 14.3 percent above the average level for February of last year. This gain over a year ago was not justified from the standpoint of total demond for petroleum products, which has not been much over 5 percent larger than last year; although it was necessitated by the urgent need for fuel oils.

Gasoline Situation

The acceleration of the stream of crude to refinery stills resulted in production of about 20,000 barrels a day more of gasoline than in the previous week.

Gasoline demand meanwhile continued restricted by winter's adverse weather, and stocks of that product continued to accumulate in large quantities. The addition for the week of over 2,000,000 barrels pushed the level of gasoline storage to 91,649,000 barrels, or within about 1,500,000 barrels of the all-time peak that was reached at the middle of March, 1938. Following that gain, the stocks were more than 10,-

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1937:						
August 28	[5]3,731,450	3,425,000	309,506,000	66,997,000	112,111,000	
September 25	3,666,300	[5]3,455,000	307,974,000	65,620,000	116,472,000	
1938:						
March 19	3,433,550	3,080,000	306,380,000	[1]93,192,000	122,067,000	
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	29,082,000	115,741,000
1939:						
January 28	3,248,250	3,235,000	271,763,000	77,279,000	26,583,000	112,766,000
February 25	3,328,850	3,185,000	271,758,000	84,597,000	23,419,000	110,252,000
March 25	3,382,350	3,225,000	273,915,000	87,561,000	21,487,000	107,551,000
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	85,794,000	[7]25,844,000	108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
May 27	3,585,250	3,405,000	278,289,000	84,152,000	25,992,000	109,386,000
June 24	3,452,800	3,430,000	272,297,000	81,733,000	30,239,000	111,726,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[3]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[7]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[3]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
1940:						
January 6	3,584,450	3,370,000	238,581,000	82,002,000	32,183,000	105,247,000
January 13	3,592,200	3,520,000	238,249,000	84,326,000	30,326,000	104,712,000
January 20	3,637,450	3,510,000	237,571,000	85,180,000	28,888,000	104,582,000
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 3	3,498,800	3,395,000	239,380,000	89,337,000	26,861,000	102,536,000
February 10, 1940	3,688,100	3,460,000	.....	91,649,000	26,007,000	102,344,000
February 11, 1939	3,283,700	[8]3,027,000	[4]272,214,000	80,950,000	31,068,000	114,887,000
■ Change in past year.	+12.3%	+14.3%	—12.1%	+13.2%	—16.3%	—10.9%

[1] All time peak. [2] Peak for 1939. [3] Lowest since April, 1922. [4] Stocks, February 4, 1939.
[5] Peak prior to 1939. [6] Lowest for year. [7] Lowest since October, 1922, due to the shutdown of six Mid-Continent states. [8] February, 1939, daily average.

000,000 barrels, or 13.2 percent, larger than on the corresponding date last year. Demand for gasoline, meanwhile, is running only 5 or 6 percent above the levels of a year ago.

Fuel Oils

Stocks of gas oil and distillate fuel came down from 26,861,000 to 26,007,000 barrels in the week ended February 10, and then were 16.3 percent smaller than a year previously, when the supply on hand totaled 31,068,000 barrels. This reduction of stocks of the heating and similar fuel oils has occurred while demand has been running about 15 percent higher.

Inventories of residual fuel oil came down from 102,536,000 to 102,344,000 barrels, after which they were 10.9 percent under the level of a year before. These oils, used as fuel by industry, also are relatively scarce, in relation to current large market demand, which is running more than 10 percent above the levels of a year ago.

Stocks of crude oil in the United States rose in the week ended February 3 from 237,339,000 to 239,380,000 barrels, when runs to stills were temporarily cut back, and the crude inventory then was about 10,000,000 barrels above the 17-year low that was reached last October. The stocks now are about 12 percent smaller than a year ago.

Indian lease sale

Five Civilized Tribes are offering oil and gas leases on lands located in Tulsa County, Wagoner, Creek, McIntosh, Okmulgee, Okfuskee, Hughes, Seminole, Pittsburg, Pontotoc, McClain, Stephens, Marshall and Jefferson counties. Bids will be accepted to February 27.

Talk of distress gasoline is declared groundless

Talk of surplus gasoline and below-cost prices at refineries was described as groundless in a statement February 14 by Harry J. Kennedy, vice president of Continental Oil Company, at Ponca City, Oklahoma.

The official said that his company, in a buying canvass, had found that only a few stray cars of gasoline, in isolated cases, were available. One independent refiner was found who would part with less than one car a day over the next month, it was stated, but his price was at the market, not below it.

"We have supplied that refiner casing-head gasoline in times past," Kennedy added, "and he is also building some storage that is not yet finished, or he would not have gone that far."

"A number of other independents, some large and some small, who are very friendly, were willing to help us out if we were in a pinch," he said, "but they felt they had to quote the average of the market, or higher."

Continental Oil Company's efforts were not applied through brokers, but through direct contact with the refiners who make the material, it was explained.

"Our own gasoline in storage at Ponca City is 27 percent below a year ago, and we are torn up here with a big rebuilding and modernizing program, so right now we could take advantage of some bargains of the right quality material in Oklahoma and Kansas," Kennedy said. "We wanted to reduce shipments from this plant to our Southwestern distributing stations and make some freight savings, too, but we didn't get very far."

Kennedy asserted that current buying activity showed that the people with the gasoline want it for their established trade during the coming high-consumption period.

"Not juggling commodity figures, but turning an honest dollar in realistic trading has been our business for 65 years, and we have learned how to buy as well as sell," he commented.

"But if the supposed distress gasoline isn't of unsalable quality, it must be out of reach of our markets at plants located where they never should have been built in the first place. The discouraging talk of excessive stocks is apparently the professional pessimism of merchandise brokers who thrive on disordered markets."

Texas permits decline to 36 in week

The Texas Railroad Commission last week approved permits for drilling 31 wells in Texas, 136 less than were allowed the week before.

Two permits were approved in the East Texas field, in Gregg County, while 2 locations were reported from the remainder of the East Central Texas area. Southwest Texas held first place with 17 approved locations, and Gulf Coast was second with 9 permits. One permit was granted in the North Texas District, in Montague County.

No permits were reported from West Texas, West Central Texas or from the Panhandle.

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Feb.)	State Allowable in Feb.	BARRELS DAILY FOR WEEK ENDED Feb. 17	Feb. 10
TEXAS—				
Texas Panhandle	.....	.....	82,700	82,750
North Texas	.....	.....	95,900	82,500
West Central Texas	.....	.....	36,050	33,050
West Texas	.....	.....	220,350	247,900
East Central Texas	.....	.....	88,500	88,250
East Texas Field	.....	.....	406,800	404,500
South Texas	.....	.....	217,300	214,100
Texas Gulf Coast	.....	.....	240,150	239,400
Total Texas	1,371,400	1,390,150	1,387,750	1,392,450
CALIFORNIA—				
Long Beach	.....	.....	44,600	45,500
Midway-Sunset	.....	.....	56,600	59,400
Kettleman Hills	.....	.....	53,700	46,900
Wilmington	.....	.....	82,200	83,300
Others	.....	.....	386,700	387,900
Total California	585,900	594,000†	623,800	623,000
OKLAHOMA—				
Oklahoma City	.....	.....	99,800	100,900
Seminole Area	.....	.....	103,150	109,500
Others	.....	.....	225,400	219,700
Total Oklahoma	429,000	429,000	428,350	430,100
ILLINOIS—				
Salem	.....	.....	245,300	237,500
Louden	.....	.....	69,850	72,875
Other New Pools	.....	.....	76,050	67,175
Old Pools	.....	.....	8,000	7,950
Total Illinois	325,500	.....	399,200	385,500

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Feb.)	State Allowable in Feb.	BARRELS DAILY FOR WEEK ENDED Feb. 17	Feb. 10
LOUISIANA—				
North Louisiana	.....	.....	69,000	69,250
South Louisiana	.....	.....	209,300	204,000
Total Louisiana	252,800	273,250	278,300	273,250
KANSAS	155,500	165,000	176,700	174,650
NEW MEXICO	100,300	113,000	113,500	109,500
EASTERN STATES—				
Pennsylvania Grade	.....	.....	77,000	76,750
Others, Eastern	.....	.....	23,000	22,500
Total Eastern States	108,900	.....	100,000	99,250
MOUNTAIN STATES—				
Wyoming	55,200	.....	69,200	62,300
Montana	15,200	.....	16,900	17,000
Colorado	4,100	.....	5,300	3,900
Total Mountain States	74,500	.....	91,400	83,200
MICHIGAN	64,500	65,000	65,100	63,500
ARKANSAS	60,000	70,000	69,600	70,250
MISSISSIPPI	.....	.....	5,250	5,100
NEBRASKA	.....	.....	0	0
*Total 8 Prorated States	3,019,400	3,099,400	3,142,100	3,136,700
Total United States	3,529,000	.....	3,736,950	3,709,750

*Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.
† Recommendation of Central Committee of California Oil Producers.

✓check this Valve O.K.

ON PUMP SUCTION AND DISCHARGE PIPING • HANDLING SEMI-FINISHED GASOLINE

Operating men the country over have approved our recommendation that Figure 1501 Cast Steel Gate Valve be used for this service—resulting in many installations of which the sectional picture, below, is typical.

Once more, the reliability and low over-all cost of READING-PRATT & CADY Valves have justified their selection and installation by the men of the Oil Industry.

★

For valves that you may need, may we suggest that you, too, will find our organization particularly well able to work with you—to recommend valves that will do the job you ask of them.

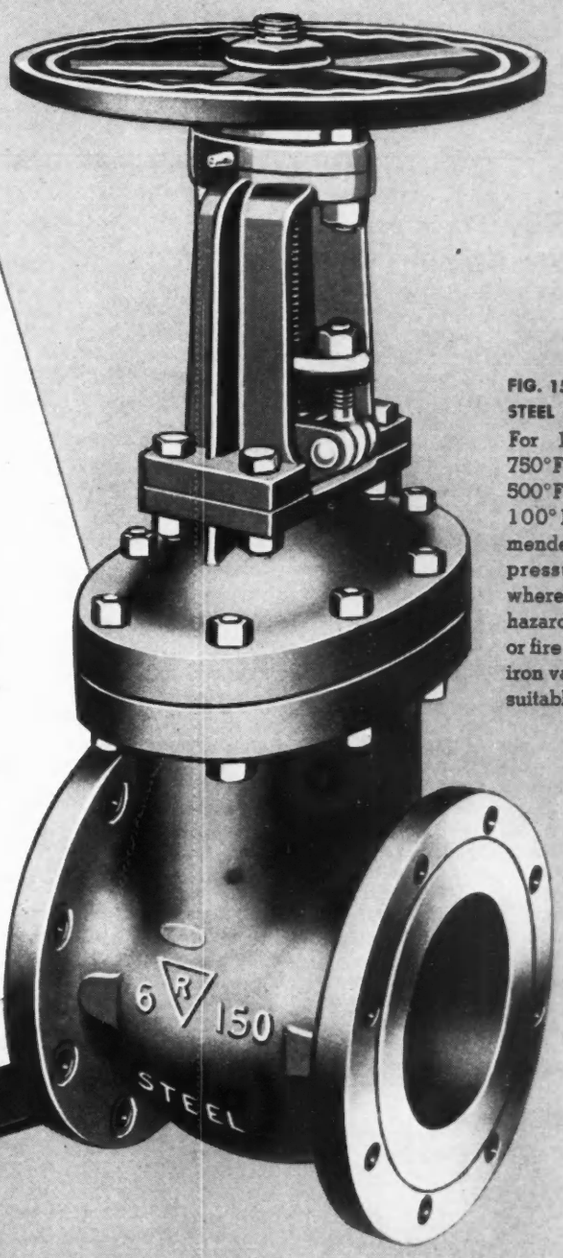
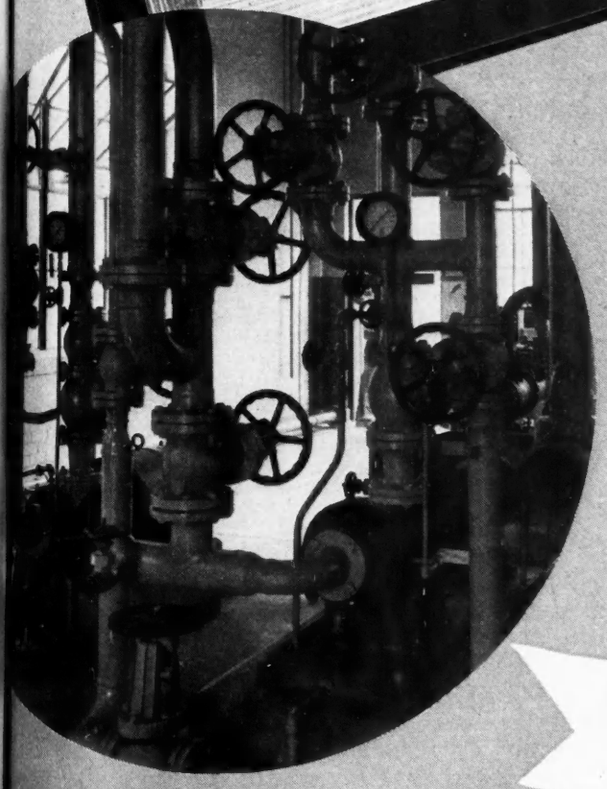


FIG. 1501 CAST STEEL GATE VALVE For 100 lbs. at 750°F.; 150 lbs. at 500°F.; 230 lbs. at 100°F. Recommended for lower pressure ranges where, because of hazardous liquids, or fire hazard, cast iron valves are not suitable.



Get Reading-Pratt & Cady recommendations, founded on intimate contact with many problems of the oil country. Write us whenever it is a matter of valves—for Boiler Feed Water and Steam Lines, Gas Wells, Pipe Lines, Refinery Lines, Filling Lines, Lines that handle heavy oils, asphalts, sludges, etc.

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AMERICAN CHAIN & CABLE COMPANY, Inc.

PIPE LINE NEWS

West Texas gas line to give Page field outlet

The construction of a 45-mile 8-inch welded natural gas line has been authorized by Lone Star Gasoline Company, subsidiary of Lone Star Gas Company, Dallas, to link the Page gas area, Schleicher County, with the latter's West Texas system and also an electric power plant at San Angelo, Texas. Surveying crews and right-of-way buyers began work on the projected line early last week. Gas in the Page pool will be supplied by Cooper Gas Company's 3 completed gassers in the 5500-foot Strawn horizon on a long-term contract negotiated when it acquired a gasser and an oil well from Lone Star Gasoline Company.

Hope Natural Gas Company moves to Clarksburg, W. Va.

Hope Natural Gas Company last week started transfer of employes and records from Pittsburgh to Clarksburg, West Virginia, in a move to centralize all activities in the West Virginia city. The company has always maintained headquarters for its operating department in Clarksburg, but its executive and office staff has been located in Pittsburgh for the past 30 years.

"We believe the move will bring the executive end in closer touch with the field operations," said L. L. Tonkin, company president, in explaining the move. "With the exception of nine members of our Pittsburgh unit who are being retired, the entire local staff will go to Clarksburg."

The company has completed a $250,000 office building in the West Virginia city.

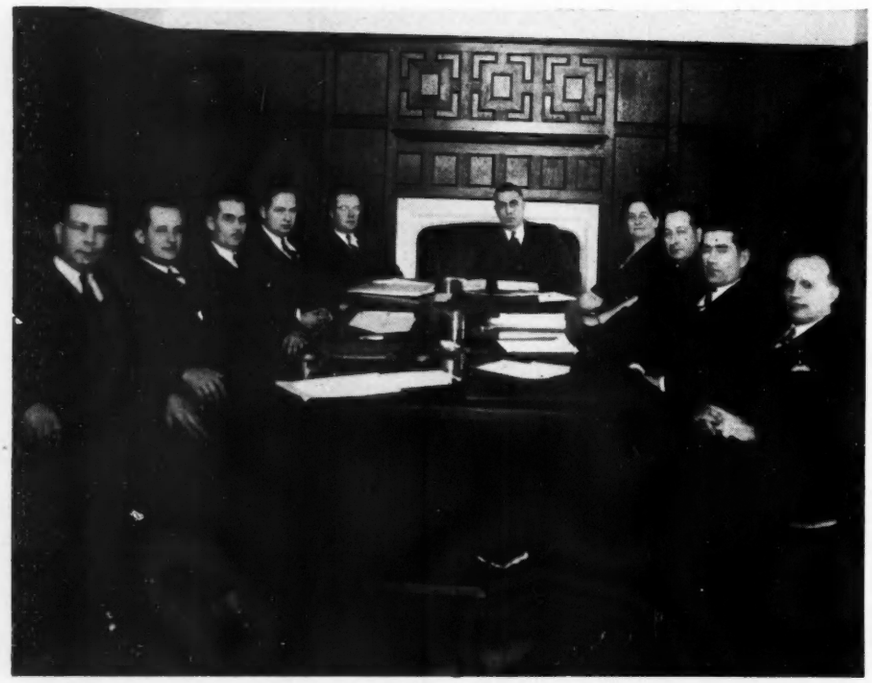
Build 20 miles of 4-inch to handle K-M-A gasoline

Continental Oil Company is to build a 20-mile 4-inch welded pipe line from its natural gasoline plant in the K-M-A deep field, Wichita County, Texas, to its refinery on the north edge of Wichita Falls. The line will transport natural gasoline and other products to the refinery, which is to be modernized and given a polymerization unit, representing a total expenditure of about $750,000. The gasoline plant, located on Waggoner Bros. ranch, Lot 7, BS&F Section 11, A-387, and 2 auxiliary units added new compressors late last year to step up the production to 35,000 gallons daily.

Stanolind to construct 13-mile line for Byars field, Oklahoma

Stanolind Pipe Line Company, Tulsa, will immediately start construction of a 13-mile pipe line from Byars pool, McClain County, Oklahoma, to connect with its Pauls Valley-Fitts artery. It will consist of 8½ miles of 6-inch pipe and 4½ miles of 4-inch.

Four producers have been completed in the Byars pool, and two others are now drilling. The rapidly expanding Beebe pool, Pontotoc County, will also be served by the new line.



Committee meeting of the Southwestern Gas Measurement Short Course which was held in Norman, Oklahoma, January 19, 1940. Left to right around the table: E. C. McAninch, E. L. Stark, C. E. Terrell, W. H. Woods, R. L. Rountree, Fay C. Walters, Miss Kate A. Niblack, W. R. McLaughlin, Earl Kightlinger, and W. H. Carson. Members of the committee not present for the picture are: R. M. Scofield, C. A. Gibson, William F. Lowe, G. W. McCullough, E. M. Myers, J. H. Page, F. M. Blair, E. H. Poe, J. H. Satterwhite, and Max K. Watson.

North Louisiana-Arkansas gas line is completed

The Louisiana-Nevada Transit Company's 70-mile 8-inch welded gas line from the Cotton Valley field, Webster Parish, Louisiana, to southwest Arkansas has been completed. The northern terminus is at Hope. Gas will be bought from the Oliphant Oil Company at Cotton Valley.

Plan sixteenth Southwestern Gas Measurement Short Course

More than 600 persons from all sections of the nation are expected to attend the sixteenth annual Southwestern Gas Measurement Short Course which will be held at the University of Oklahoma, Norman, April 16, 17 and 18.

All plans for the course were formulated at a meeting of the general committee at the university. Fay C. Walters, Panhandle Eastern Pipe Line Company, Kansas City, general chairman, presided at the morning session, and R. L. Rountree, United Gas Pipe Line Company, Houston, chairman of the program committee, presided at the afternoon session. Four new general committee members, elected at the previous group meeting in Dallas, were present. They are E. C. McAninch, Oklahoma Natural Gas Company, Tulsa; E. L. Stark, The Foxboro Company, Dallas; C. E. Terrell, Southern Natural Gas Company, Birmingham, and W. H. Woods, Gulf Oil Corporation, Houston.

Besides Walters and Rountree, chairmen of other committees are: W. H. Carson, dean of the college of engineering, University of Oklahoma, local arrangements, banquet and entertainment; Earl Kightlinger, Arkansas Louisiana Gas Company, Shreveport, exhibits; C. A. Gibson, Cities Service Gas Company, Bartlesville, Oklahoma, publications; R. M. Scofield, Lone Star Gas Company, Dallas, Study of Practical Methods, and Miss Kate A. Niblack, Oklahoma Utilities Association, Oklahoma City, registration and publicity.

Other members of the general committee are: William F. Lowe, Natural Gasoline Association of America, Tulsa; G. W. McCullough, Phillips Petroleum Company, Bartlesville; W. R. McLaughlin, Pittsburgh Equitable Meter Company, Dallas; E. M. Myers, Corporation Commission of Oklahoma, Oklahoma City; J. H. Page, Kansas Corporation Commission, Wichita; E. H. Poe, Nataural Gas Section, American Gas Association, New York; J. H. Satterwhite, American Meter Company, Tulsa; Max K. Watson, Canadian River Gas Company, Amarillo, and F. M. Blair, Railroad Commission of Texas. Next meeting of the committee will be held in Oklahoma City, March 4.

Except for a banquet session, delegates spend their time in classes because they must follow a regular schedule each day. During their stay at the university they hear discussions and lectures on problems pertaining to the measurement and regulation of dry and casinghead gas.

U. S. FIELD OPERATIONS

Scattered wildcats vie with Devonian tests for attention

Centralia.—Wildcat tests in Coles and Hamilton counties, a deep test in the Cisne field of Wayne County, and Devonian operations in the Lake Centralia-Salem and Centralia Townsite fields continued to absorb most of the attention of Illinois operators last week.

Kingwood Oil Company Thursday was drilling plug at Wilson 1, NW NW SE 6-6s-7e, Hamilton County, to test a show of oil in Cypress sand at unrevealed depth. Hole was drilled to 3250 feet, through the McClosky, and after an electric survey, cemented casing to the Cypress. Location is 5 miles southeast of McLeansboro, home of Lieutenant-Governor John Stelle, foe of the prorationists.

In Coles County, 2 miles south of Mattoon, Carter Oil Company's Seaman 1, NW NE SW 35-12n-7e, was drilling at 1500 feet, nearing the expected depth of the Weiler sand, first prospective oil-bearing formation the well will encounter. Carter Oil Company, with only 6 more months of development ahead of it in the Louden field of Fayette County which the company discovered, is expected to drill several wildcat and core-drill tests during the spring and early summer.

In the Cisne field of Wayne County, Pure Oil Company's deep test, Billington 3, C E½ SE SE 27-1n-7e, was drilling at 4500 feet. It is slated to test the Devonian and possibly the Trenton and St. Peter. The site is just across the road from the company's discovery well in the Cisne field, drilled in 1937.

The Devonian completion program in the Lake Centralia-Salem field mounted to new heights during the week as three of the pool's chief operators, Magnolia Petroleum Company, Shell Oil Company, and The Texas Company brought in several wells with unusually large potentials. The Texas Company's Fosseick 13, NW NW 29-2n-2e, flowed 1235 barrels in 3 hours from 3408 feet, to attain a rating of 9888 barrels a day, second largest potential ever reported in Illinois.

An east outpost in the formation, Wiser Oil Company's Weems 10, NW NW 33-2n-2e, an eighth of a mile east of Devonian production, was acidized Thursday in pay at 3434-48 feet and Friday was flowing 60 barrels an hour.

Best completion yet reported in the Centralia Townsite field is Max Pray's Storer 1, NE 13-1n-1w, which flowed 1170 barrels from pay at 2908-15 feet in 24 hours after a 750-gallon acid treatment. Other of the field's 8 completions have been gauged at 200 to 888 barrels initially. Five blocks east of production, J. W. Menhall's Illinois Central 10, Block 65, set 5½-inch casing after coring pay at 2905-06 feet. The test is a few blocks southwest of the business district. A north outpost, Louis Lilly's Williams 1, SE 12-1n-1w, was flowing by heads from pay topped at 2903 feet. Apparent success of the test has caused a flurry of derrick building in its vicinity.

In Jefferson County, a Shell Oil Company farmout, Gibson et al's Mall 1, NE NE NW 36-2s-1e, has been halted at 1100 feet after failing to recover circulation. The operators plan to start a new hole 660 feet from the abandoned test. Several edge wells on the Dix pool of Jefferson County, all farmouts of Carter Oil Company, have been completed by Alma Oil Company. Cunningham 1, W½ NW SE 3-1s-2e, pumped 127 barrels a day from Benoist at 1963-86 feet; Gossett 1, NW SE NE 16-1s-2e, pumped 40 barrels from Benoist at 1934-37 feet, in 6 hours; Copple 1, NE SE NW 9-1s-2e, was testing Benoist pay.

Indiana

Outpost to Rockport gas field has 150 barrels oil in Palestine

Evansville, Ind. — Interest in the Rockport gas field area of Spencer County reached a new high last week when a test drilled for a ½ mile south extension was completed for an estimated 150-barrel oil well.

Ottis L. Sturboise's Ethel May Boyd 1, C NE NE 31-6s-7w, carried 15 feet of oil saturation in the gas field pay sand, now identified as the Palestine, at 930 feet. The test, cemented as is the practice in this field on top of the sand with a strong show of gas flowed oil at the rate of about 8 barrels an hour when drilled in. The test now is shut in for tankage. Offset acreage is held by Gulf Refining Company, Kentucky Natural Gas Company and Damron Brothers.

A Gibson County wildcat 8 miles east of Griffin field production is estimated capable of 300 barrels daily after 3000 gallons of acid in the McClosky. It is Harry Fotiades' Perry Flener 1, southwest of Owensville, SE NW SE 21-3s-12w, which was swabbing 14 barrels an hour. It was to be put on pump.

Poor McClosky

Joe Minton and D. M. Hollingsworth's L. P. Hill 1, NW SE NW 7-4s-13w, Posey County wildcat just southeast of Griffin, ran electric log that showed two slight McClosky shows at 2893-96 feet and 2903-05 feet. Shut down for orders, it may set pipe to a fair show in 10 feet of Cypress. Bottom is at 3013 feet.

Superior Oil Company's Mumford Realty Company 2, SW SW NE 31-3s-13w, northeast of Griffin, Posey County, also made only salt water after the hole was plugged back and casing set to a show in the Pennsylvanian, from 1605 to 1621 feet. The test, inactive for several weeks, was drilled to 2716 feet. It is just southwest of the company's Mumford 1, completed for a small producer in the Cypress.

In eastern Gibson County, Barton Township, location has been made for Al J. Walker's Oscar Schmidt 1, southeast of Mackey, NW NE NW 24-3s-9w. The test, a Gulf Refining Company farmout, is southwest of Walker's Pottsville sand discovery on the Oscar Schmidt tract drilled early last year and completed at about 950 feet. H. C. Amis, Owensboro, Kentucky, is contractor.

In Putnam County, 5 miles west of Greencastle, Stanolind Oil & Gas Company's Wells Estate 1, NW NW NW 15-14n-5w, was swedging casing following 280-quart nitro shot at 1940-71 feet. Formation was tentatively identified as the Trenton. The wildcat was plugged back after drilling to 2822 feet.

Southwest of Evansville, Charles Steele et al's Tom Heldt (Indiana Trust and Savings Bank) 1, NE SW 18-7s-11w, Vanderburg County, made salt water when drilled in to Waltersburg. It was abandoned at 1932 feet.

In the Schuh Bend area of Wabash County, Longhorn Oil Corporation's Mary Heil 3, Lot D 7-3s-13w, was setting casing at 2480 feet to test Cypress.

About a mile southeast of Keensburg, Wabash County, Continental Oil Company's Legier 2, SW SW SE 17-2s-13w, was drilling at 2422 feet towards Cypress after drill-stem test in the Biehl sand yielded 950 feet of oil in 41 minutes. The test is just south of the company's Legier 1, completed in the Biehl.

Dry and abandoned at a total depth of 2490 feet was Halsted Petroleum Company's Gray-Douglas 3, SE SE NW SW 29-2s-13w, at the base of Schuh Bend.

Warmer weather in Indiana brought a State Road Commission ruling that prohibits weights in excess of 6000 pounds over secondary roads, and many rigs are inactive. Particularly hard hit by the ruling were Griffin field operators who had planned to move to new locations as soon as weather permitted.

Kentucky

Daviess County wildcat starts at 60 barrels

Owensboro, Ky.—Sam Cobb et al's James Tinsley 1, Section 21-N-30, wildcat a mile west of Pleasant Ridge, Daviess County, was completed at 948 feet for an estimated 60 barrels daily.

Preparing to spud were 4 new tests in Ohio County. In the Narrows section, ½ mile east of Narrows field production, Dr. F. D. Clark has machine on location for Fentress 1, Section 9-M-34. J. M. Smith is contractor. Also in the Narrows section, Fred Huff is rigging up for Ben Gentry 1, 3-M-34. About 1½ miles southeast of Taffy,

Elvis Dehart was rigging up for the Roscoe Baird 1, Section 18-M-32. About 1½ miles southeast of the Barnett's Creek pool production, southeast of Buford, Ohio County, E. J. Jimmie Corless has machine on location for the Clifton Hoover 1, Section 19-M-31.

Porter Evans' Foster 1, wildcat 3 miles southeast of Rosine, Ohio County, was drilling below 200 feet. Murphy & Alvey are contractors.

Glenn Seaborn, Kansas operator, has taken over Shindal Oil Company's A. B. Vaughan 1, Section 24-L-20, north of Blackford and southwest of Clay, Webster County, and was underreaming below 1000 feet. The wildcat had been inactive for several months.

Dehart & Likens' Murphy 1, Section 13-N-29, in the Utica field of Daviess County, was drilling at 1025 feet.

Bad roads have halted work on Sun Oil Company's Corydon Unit 3, Sadie Mason farm, in the Corydon section of Henderson County. Bottom is at 2112 feet.

Oklahoma

New oil areas opened in Payne and Lincoln counties

Tulsa.—Two new producing areas were opened in Oklahoma last week. Helmerich & Payne et al's Berry 1, NW SW SE 24-18n-4e, 1½ miles east of Broyles pool, Payne County, flowed 100 barrels in 14 hours. Some 500 to 600 feet of rotary mud was in the hole, and operators were cleaning out. Oswego lime was perforated above 2900 feet and will be acidized. Second Wilcox sand was dry at 3720 feet.

Two miles northeast of Skellyville pool, Lincoln County, Youngblood et al's Wright 1, NEc SE 32-16n-6e, filled 1000 feet with oil and some mud, and was estimated good for 20 barrels. Mississippi lime was topped at 3722 feet and 7-inch casing cemented at 3750 feet. The hole was carried to 4017 feet in Viola lime and a 5-inch liner set at this marker.

Black Gold Petroleum Company's Locquemont 1, NEc 28-14n-6e, 1½ miles southwest of Sac and Fox pool, Lincoln County, previously abandoned at 3137 feet in Prue sand, cleaned out hole and put 10 barrels into tankage in two hours. It was shot with 380 quarts during the completion stage, making 65 barrels the first day, but later went dead. After properly cleaning out, it is expected to make a 15-barrel well.

North of Ramsey pool 2½ miles, Gardner Petroleum Corporation's Ahberg 1, NE SW SE 2-18n-1e, topped first Wilcox sand at 5049 feet, cored from 5070 to 5072 feet to recover only hard white sand. This wildcat checked structurally lower than producers in Ramsey pool. Misener sand showed only slight staining.

Sinclair Prairie Oil Company was making slow time on its deep test at German 1, SW NW NW 1-6n-13w, southeast of Carnegie, Caddo County. At 9360 feet, Wilcox sand continued to be hard and tight although stains of oil were reported.

Hall-Briscoe will drill a southwest diagonal offset to the Jones pool discovery well, Oklahoma County. Hughes 1, NEc SW 28-13n-1e, will be drilled to the Wilcox sand.

Newman & Heitgras have staked location for Anderson 1, SWc NE 28-15n-1e, 6 miles southwest of Meridan pool, Logan County. Companies having acreage within the block are Deep Rock Oil Corporation, Selby Oil & Gas Company, Gulf Oil Corporation, Shell Oil Company and three independents.

Two dry holes have defined the southwest portion of Beebe pool, Pontotoc County. C. G. Kendall's Anderson 1, NEc SE 35-5n-4e, was dry at 2635 feet. W. A. Delaney's Phoenix 1, NWc SW 36-5n-4e, cut a fault and was abandoned at 2965 feet.

Malernee Oil Company's Harris 1, C SW NE 14-25n-1e, west of Ponca City pool, Kay County, flowed 50 barrels in 3 hours after a 15-quart shot. Prue sand is the productive horizon at 3743-84 feet. It will be re-shot and tested before final completion.

Shell Oil Company's Hutchen 1, NE NW SE 19-7n-17w, Hobart pool, was drilling below 975 feet in granite wash. Pontotoc and Viola limes pay off in this pool around 1100 feet. George Planteen et al's Bozeman 1, SEc NE 14-5n-18w, 12 miles south of Hobart pool, was abandoned at 1218 feet.

Forest City Basin

Richardson County test cements casing at 3183 feet

St. Joseph, Mo.— Pawnee Royalty Company's Meyers 1, C NW NW 24-1n-15e, Richardson County, Nebraska, cemented 7-inch casing at 3183 feet and was drilling below 3250 feet, expecting the Wilcox sand shortly. The discovery well, Boice 1, C NE NE 18-1n-16e, was still shut in for tankage and better weather conditions.

Phillips Petroleum Company's Creston 1, C SE NE 31-71n-30w, Union County, Iowa, has 700 feet of water in the hole from Hunton lime at 1690-1695 feet. This wildcat is below 1800 feet with nothing showing. A seismograph crew of the company is shooting around Falls City.

Two shallow tests in Jackson County, Missouri, have been abandoned. Brude Dodson's Fee 1, C NW NE 17-47n-30, 2 miles west of Shawhan gas pool, was a failure at 500 feet, Burbank sand being dry at 472-80 feet. Hulse & Christopher's Wiston 1, CSL NE NW SE 22-49n-32w, 2 miles southeast of Blue Ridge gas pool, shot Squirrel sand at 470-95 feet with 20 quarts for only a puff of gas. The test was abandoned at 510 feet.

Coastal Petroleum Company has resumed drilling Pierson 1, SW NE NW 27-22n-6e, making slow time below 550 feet. Roach-Vincent et al's Dillingham 1, C N½ NE SW 16-53n-34w, was shut down at 1025 feet. Salt water entered the hole at 900 feet.

Kansas

Ellinwood South pool opened by 229-barrel Arbuckle well

Wichita.—Brown and Willard's Knop 1, CNL NE SE 6-20-11w, ⅝ mile southwest of Ellinwood pool, Barton County, established a daily potential of 229 barrels to open the Ellinwood South pool. The discovery drilled to 3346 feet in Arbuckle lime.

Sharon Drilling Company et al's Leurman 1, CSL NE SE 1816-13w, ½ mile southeast of Trapp pool, Barton County, was swabbing 10 barrels hourly. The hole filled 2500 feet with oil from Arbuckle lime at 3362 feet.

Skelly Oil Company completed two large gas wells in the Cunningham pool, Kingman and Pratt counties. Miles 7-A, C NE 30-27-10w, gauged 125,000,000 cubic feet daily from Viola lime at 3972 feet, after acid. Ratcliff 9, C NW 30-27-10w, 1½ miles west of the Miles gasser, had an open flow of 116,000,000 cubic feet from Viola at 3982 feet.

Ellinwood pool, Barton County, was defined as Alpine Oil & Royalty Company et al's Andrea 1, CSL SW NE 8-20-11w, was abandoned at 3395 feet in Arbuckle lime. C. Pigott et al's Schneider 1, C N½ NW NW 6-18-15w, 1½ miles north of Otis gas pool, was a failure at 3697 feet in Reagan sand, topped at 3688 feet. Vernon Oil & Gas Company et al's Bird 1, C SE NW 33-18-15w, Otis area, was testing 35 barrels daily. Hole is bottomed at 3510 feet in Reagan sand.

Prusa area, Barton County, was active with 5 new tests underway. Hinkle Oil Company et al's Burmeister 1, CWL NW SW 27-16-11w, ½ mile east of Prusa, cored saturated Arbuckle lime at 3357-61 feet and will drill plugs. An extension is indicated. The company immediately staked 3 new tests: Rous 1, NEc 32-16-11w, ½ mile southwest of production in South Prusa; Kroutwurst 1, SWc SE 34-16-11w, and Wilenberg 1, SWc NW 27-16-11w. B. B. & M. Drilling Company et al's Esfield 2, C S½ NE SE 28-16-11w, completed rigging up Barnsdall Oil Company's Rous 3, C S½ NE SW 28-16-11w, was drilling.

Tulsa Oil Corporation et al's Scott 1, SE SW SW 12-34-5e, 1½ miles north of Rahn pool, Cowley County, was abandoned at 3001 feet in Mississippi lime. Jock Garden was rigging up at Waldschmidt 1, SEc NE 1434--5e,

northwest of the Rahn pool. C. F. Meyers completed pits at Dunn 1, NWc 33-34-5e, 4 miles southwest of the pool.

T. S. Dustin et al have moved in a rig at Shearer 1, NE NW NW 29-4-9e, southwest of Frankfort, Marshall County. This wildcat was previously abandoned in 1923 at 1045 feet, and now is the only well drilling in that section of the state.

Mid-Plains Oil Corporation et al's Newkirk 1, CSL SW SE 14-18-7w, 4 miles east of Geneseo pool, Rice County, was drilling below 3335 feet. Misener sand at 3244-92 feet was watery.

Black & Marshall's Dolecheck 1, CNL NW NE 24-16-12w, 1½ miles southeast of Feltes pool, Barton County, was a new wildcat start. Duwe & Farris' Adamek 1, C S½ SW NW 17-16-10w, was rigging up rotary. Atlantic Refining Company et al's Stoltenberg "E" 1, C N½ NW SE 27-16-10w, ¾ mile from Stoltenberg pool, was a location. Lauck and Moncrief were drilling below 800 feet at Ehler 1, C W½ SW NW 35-16-10w, Ellsworth County.

George H. Buttie staked location for Ziettlow 1, SW NE SE 18-17-1w, ½ mile east of Roxbury pool, McPherson County. Foster et al's Howard 1, CEL SW SW 8-34-4e, 5 miles east of Geuda Springs pool, Cowley County, was a location.

Sagamore Oil & Gas Company have staked Rankin 1, SW SE SW 20-14-22w, as an extension try for the Gardner pool, Johnson County.

Smith et al's Cannon 1, NWc 28-26-7e, Young pool, Butler County, was abandoned at 2775 feet in Mississippi lime.

D. J. Marshall's Weber 1, NEc SE 14-16-12w, north of Feltes pool, Barton County, was completed for a potential of 2702 barrels daily. Arbuckle lime at 3346-50 feet was acidized with 1000 gallons.

West Texas

Lower Permian drilling gains interest in basin area

Midland.—The search for production in the Lower Permian lime series is commanding greater interest among basin operators. Ward County entered the picture when Gulf Oil Corporation's Wristen Bros. 5, each corner of W¼ H&TC Section 18, Block 5, tested show of oil and gas with 900 feet of drilling fluid in using tester on saturated lime zone at 3875-4260 feet. Drilling was resumed with Ordovician as the objective. The show is believed to be the equivalent of the new Holt oil level in Ector County, and possibly the same zone that tested a small amount of oil and gas when Gulf Oil Corporation's Hutchings 1, 12½ miles north, drilled to 4787 feet before Ward County recorded its first strike. Shell Oil Company's Sloan-Owen 1-B, ½-mile west of Wristen 5, drilled to 4415 feet in 1930, but no test was made in the deep lime because of carrying oil in hole from the regular pay.

Two more Holt zone projects have been authorized for Ector County, including one for the west flank of the North Cowden field. Ralph H. Gill et al have met with success in selling acreage and raising contributions to drill J. E. Parker 1, NEc SE T&P Section 12, Block 45, T-2-S, to the Holt zone, or to 5500 feet. Efforts to finance a regular Permian test last spring failed. Landreth Production Corporation and Shell Oil Company's Johnson 1-A, wildcat between the Foster and Goldsmith fields, was delayed the past week through the loss of rotary returns in brown shale at 5101-16 feet. This shale zone overlies the Holt lime section. In northwestern Ector County, M. A. Grisham et al's Cowden 1 was drilling at 3990 feet, and 4 miles to the north in Andrews County, Richmond Drilling Company et al's University-Atlantic 1 logged nominal oil saturation at 4345-72 feet. The latter two are Holt pay tests.

Stanolind Oil & Gas Company's W. F. Cowden 1, fourth Holt pay test for the northwest edge of North Cowden field, encountered water at 5223-37 feet, where bailing test yielded 1¼ barrels oil and 2¼ barrels of water in 7 hours. The hole has been plugged back to 5215 feet to acidize oil saturated zone at 5158-94 feet. The water level appears to be fairly constant in this deep lime as Cowden 1 reached water at 2108 feet sub sea, while Gulf Oil Corporation's Holt 1, situated 2¼ miles southeast, drilled into water at 2096 feet below sea level. The latter scored flowing production after plugging back and acidizing.

Landreth Production Corporation will attempt to expand the Holt zone 1½ miles to the southeast in deepening T. P. Land Trust 2-A, NWc T&P Section 3, Block 43, T-1-S, which was completed August, 1934, making gas with small volume of oil and water after plugging back from 4275 feet to 4248 feet. It is on the west edge of the mid-section of the field.

Development of the Holt zone is due to spread to the interior of the North Cowden structure. Better porosity and thicker pay section is anticipated. Acreage is in demand throughout the field, and leases that are not considered attractive for regular Permian development are being bid for at rising prices. Sinclair Prairie Oil Company paid $3000 cash and $10,000 payable from ⅛ of the oil production for lease on SW of SE PSL Section 20, Block A. This unit was not drilled because of the small yield of the offsets in the Permian.

Richmond Drilling Company, R. R. Rhodes et al's Johnson 1, NWc T&P Section 25, Block 43, T-1-S, is seeking a ¾-mile southeast extension to regular Permian production in the North Cowden field. The 40-acre drilling site was donated by Sinclair Prairie Oil Company along with a $7500 dry hole contribution for a 4500-foot test. In the event of an oil completion, the latter holds option to purchase the well. The independent group own lease on SE Section 23, being a northwest offset to their test.

Restoration of the production allowable of the Wasson field from 18,720 barrels to 38,078 barrels daily effective February 15 by an amended order of the commission may incur transportation problems. The field is served by Alco Pipe Line Company and Shell Pipe Line Corporation's 6-inch carriers, each rated at 12,000 barrels daily, and by Humble Pipe Line Company's looped 6-inch, which has a capacity of 17,000 barrels daily. The former has a market for only 5000 barrels daily. The new allowable can not remain in effect for any appreciable period without pipe line proration, as the field is adding more oil completions each week than any single area in the Southwest. Basin Pipe Line Company proposes to build a 6-inch line from Wasson to Cosden Petroleum Corporation's refinery at Big Spring.

Skelly Oil Company's J. S. Masterson 1-J, ¼ mile southwest of production in the Apco pool, Pecos County, became the fourth Ellenberger producer in developing a natural flow from broken saturation at 4562-4616 feet. The well kicked off through tubing with a flow of 32 barrels of oil the first hour after recovering oil circulating load. It was shut in 2½ hours then flowed 10 barrels hourly. The output increased to 129 barrels 42-gravity oil in 9 hours after using 1500 gallons of acid. Top of Ellenberger was cal'ed at 4560 feet, with an elevation of 2437 feet, being 44 feet higher on this marker than the nearest producer.

Humble Oil & Refining Company's Young 1, C N¼ of W¼ H&GN Section 33, Block 10, Pecos County wildcat and 8½ miles northwest of the Apco deep pool, was coring at 5075 feet with the Ordovician section due near this level.

Development of the Page pool, Schleicher County's 5500-foot Strawn horizon that has 3 gas-distillate wells and a flowing oil well, is due to be accelerated as result of Lone Star Gasoline Company having contracted to construct a 45-mile 8-inch line to marget the gas at San Angelo. The latter has assigned its leases, including the oil discovery and a gasser, to Cooper Gas Company in affecting a long-term gas purchase contract. Cooper Gas Company has 2 additional tests underway, with more drilling projected to build up a reserve for a market outlet of 5,000,000 feet of gas, or more, daily. Gassers in this area yield considerable distillate, which will be an added source of revenue to the producer without proration restrictions.

Deep mineral rights were retained by 2 majors in subleasing acreage in the McCamey field, Upton County, for Permian development. One or more deep tests for the area have been contemplated for some months, with the Lower Permian and the Ordovician as the objectives. Humble Oil & Refining Company assigned to J. S. Pittman et al the southernmost 30 acres of Section 6, Block R. E. C. Grooms Survey, retaining rights below 2500 feet. Similar reservation was made by The Texas Company in farming out to Clark & Cooper NE Section 11, Block 3½, excepting 10 acres around its Richard King 23, a pumper. Both deals call for immediate drilling, with 1/16 over-riding royalty.

North Texas

Montague County wildcat produces; another favorable

Wichita Falls.—Prospecting in the deep lime horizon in North Texas yielded an oil discovery in eastern Montague County while another wildcat in the county logged favorable showings. Archer County shared interest when a wildcat and an outpost to the Hull-Silk field passed up nominal oil saturation to fulfill depth obligations.

The Montague County strike was made by Sinclair Prairie Oil Company's Howard 1, near southwest corner of W. Wallace Survey, ¾ mile west of Bonita, in Bend lime, topped at 5151 feet. The well flowed when formation tester was used on broken sand and granite wash pay at 5241-49 feet, indicating a successful completion. Pipe will be landed near the 5240-foot level. This wildcat was drilled on geophysical information, and was relatively low on the Canyon and Strawn series, which failed to warrant testing.

Walter K. Jones Drilling Company's Johnson 1, SW ET Section 5, 4 miles southeast of Montague, drilled and cored oil saturation in Strawn at 3759-73 feet. Formation tester failed to yield oil or gas, and drilling was resumed. Walter Gant and Continental Oil Company's Brown 1, wildcat in western Montague County, was swabbing a small amount of oil with water on initial test of Ellenberger zone at 7288-7341 feet. It is due to plug back and perforate pipe opposite more favorable saturation passed up in Bend and Strawn. W. B. Omohundro et al's Seay 1, 3½ miles south of Ringgold, was drilling shale at 5215 feet, having completed original depth contract.

Southwestern Archer County's contribution was Petroleum Producers Company's Wolf 1, NWc Section 2, J. Poitevent Survey, 9½ miles northeast of Megargel, which logged broken oil saturation at 4777-95 feet. Top of Bend was called at 4770 feet. It is scheduled to drill deeper.

Continental Oil Company's Wilson McCrory 1-A-20, mile east of the most northeasterly portion of the Hull-Silk field and about the same distance north by east of the McCrory one-well pool, passed up oil saturation in Strawn at 4281-4328 feet and was drilling at 4400 feet. The lower Strawn is a producing prospect for this test although it will continue to the Bend.

Bridwell Oil Company's Halsell 2-B, north offset to the discovery of the Halsell pool, western Clay County, flowed 93 barrels of 41.6-gravity oil natural in 3 hours through ½-inch choke from Lower Strawn saturation at 4780-4805 feet. The company's 3 completions are spotted at 933-foot intervals along a north-south trend, and the discovery occupies the highest structural position. The next test is due to be a northwest outpost. The production is delivered via a 2-inch line to the Gulf Refining Company's carrier at Henrietta station.

Shell Oil Company's Henderson 1, southwestern Clay County wildcat that has been in process of completion since late in December, flowed 125 barrels of pipe line oil in 4 hours after perforating 4¼-inch pipe at 3120-21½ feet. Perforations were filled with cement to tap the casing opposite Strawn saturation near 3419-32 feet. The hole originally was carried to 3824 feet, logging 2 lower oil zones in the Strawn, and both tested water in plugging back by stages.

Jack County's new Strawn discovery by Paul Steed and Joe Cooper's Mathis 1, on 73-acre tract, J. H. Neesmith and BS&F Surveys, 4 miles southwest of Jacksboro, flowed 150 to 200 barrels daily on short test last midweek. Production is from saturation at 2876-83 feet. The partnership originally held 600 acres in their drilling block, and sold spreads to 4 companies. The test was drilled on the theory that it would be on a production trend from the Bryson district, according to Steed, plus the advantage of being about the average distance between pools that make up the district.

Bert Ligon et al's C. F. Collins 2, southern Wichita County wildcat and 3 miles west of Wichita Falls, failed to make a producer in Strawn saturation, topped at 4291 feet, and is awaiting orders at 4425 feet. W. B. Omohundro et al's Lockridge 1, L. Neatherly Survey, east outpost for the K-M-A deep area, missed the Strawn producing zone in drilling to 4193 feet, but may continue to the Ellenberger horizon.

Contracts awarded for two South Texas recycling plants

Contracts have been awarded for two recycling plants for the South Texas Gulf Coast, and plans are being made for a natural gasoline plant in another area.

Contract has been awarded to Hudson Engineering Company, Houston, for the construction of a recycling and natural gasoline plant in the East Alice field, Jim Wells County, for W. R. Davis & Company, Houston. This concern recently made a deal with several lease holders in the pool and unitized the properties. A number of wells have been drilled to supply wet gas for the operation. The plant is expected to process a minimum of 60,000,000 cubic feet of gas per day to produce 50,000 or more gallons of fluid. Wells for both input and output have been drilled to the 4700 and 5100 foot-high pressure sands.

Gulf Plains Corporation awarded contracts for its project in the Stratton field, Nueces County. General contract was awarded to Stearns-Rogers Company, Denver, for a consideration of $965,600. The entire project, including construction of the plant, drilling of wells to supply it with gas, laying of the lines and other expenses, will total $2,100,000. Plans call for a 100,000,000-cubic-foot daily capacity absorption-type plant with an extraction unit, all to operate under a minimum of 1500 pounds. Gas will be returned to a 6600-foot sand.

Approximately 20 miles of high pressure gathering lines will serve the plant. A connection will be made to the Corpus Christi Corporation's pipe line to Corpus Christi for transportation of the finished product. Officials of the Gulf Plains Corporation and the Corpus Christi Corporation are associated. The plant will be on a solid block of 6000 acres, most of which was acquired from the Texon Royalty Company on a development basis.

Humble Oil & Refining Company, with more than 60 producing wells in the Kelsey field, is understood to be planning a plant in the near future in this field.

East Texas

Chapel Hill oil discovery increases flow; to acidize

Tyler.—Greater volume of oil and gas was developed by Shell Oil Company's Campbell 1, first oil completion for the Chapel Hill pool, eastern Smith County, after adding 95 shot perforations of the 5½-inch casing opposite the Pettit zone at 8036-58 feet. The well flowed 255 barrels of 42.6-gravity oil initial on proration gauge through ⅜-inch choke, with gas/oil ratio of 912/1, at the end of the official test pressure on tubing was 225 pounds and 1000 pounds on casing. Earlier production test was through 40 perforations opposite the base of the Pettit saturation at 8058-68 feet. The well may be given acid treatment before moving off rig.

Sun Oil Company's Huddle 1, 4½ miles south by west of the Chapel Hill oil discovery and 2 miles due south of a gas-distillate producer in the Second Glenrose at 7528 feet yielded small volume of gas with distillate and salt water when formation tester was used at 7383-7413 feet. Additional gas pay was logged in coring to 7453 feet with hard sandy lime the last 20 feet.

A new depth record for the Woodbine belt was attained the past week when Shell Oil Company's Dorsey 1, Percilla area, Houston County, progressed to 10,365 feet. It will continue to the Pettit.

Samuell and Zephyr Oil Company's Barron 2, ½ mile northeast of the gas distillate discovery of the Barron pool, Limestone County, increased its gas yield to 3,000,000 feet daily after perforating casing in the Upper Pettit, topped at 5594 feet with first porosity at 5603 feet. The hole was drilled at 5705 feet.

Ask increase to 12,500 barrels for Cayuga field, Texas

Pan-American Pipe Line Company requested an allowable of 12,500 barrels daily for the Cayuga field, Anderson and Henderson counties, at a hearing before the Texas Railroad Commission last week. The company said the present allowable is 7750 barrels a day and that it had a demand for 11,000 barrels. The company is connected with about 80 percent of the field.

Tide Water Associated Oil Company, the other purchaser, said it would take its share of the oil. Purchasers asked that the increase requested be made effective February 1.

Seaboard Oil Corporation presented testimony to show that the additional oil could be produced without waste.

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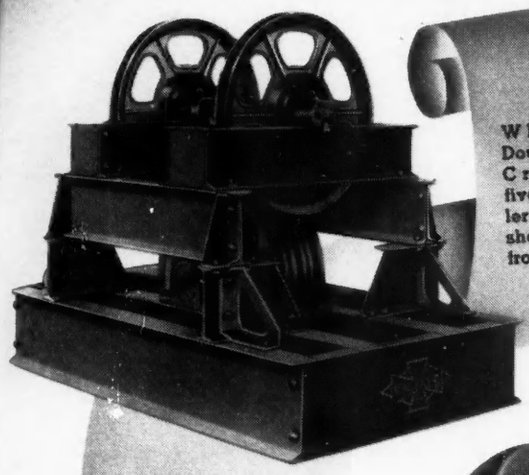

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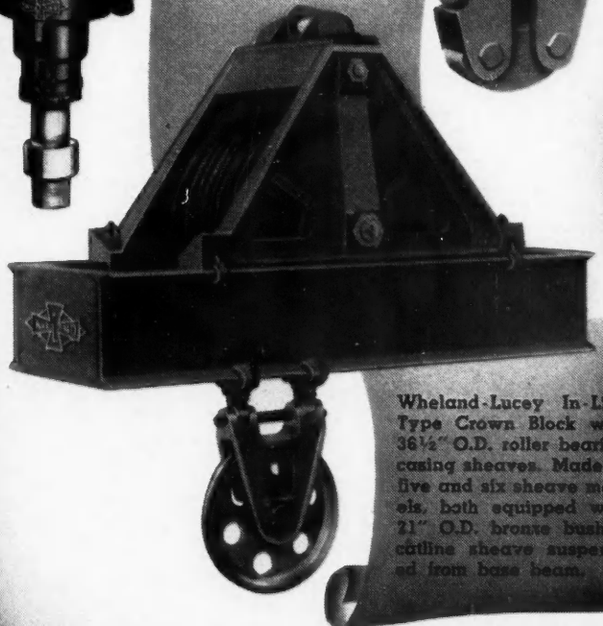

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Southwest Texas

Wade City test gets oil from Alice pay on drill-stem test

Corpus Christi.—Wade City, Jim Wells County distillate pool, became a crude oil field late last week as a drill-stem test in Rodney Delange's Maggie McNeill 1-A, 1320 feet east of the discovery, recovered 4500 feet of pipe line oil in 20 minutes. The test cored sand at 4219-30 feet and the test was made at the top of the 11-foot section. Chokes were ¼- and ⅜-inch. It rocked up 63 pounds pressure during the test. Casing was set.

The discovery is of prime importance as the sand is classified as the main Alice pay in the Vicksburg zone. It is about 175 feet below the top Vicksburg pay found in the discovery distillate producer. Drilled by Gorman-Yoakam Drilling Company, the well is 330 feet from the south line and 1650 feet from the west line of the lease in the Casa Blanca Grant. This is the northernmost producing area along this trend to find production in the main Alice sand, indicating that an extension of the exploratory work to this zone will result immediately.

Continental Oil Company's St. Charles 1, discovery of the St. Charles field in Aransas County, was still running wild but the blaze had been extinguished. An effort will be made to install a control head to bring the 9335-foot operation under control. It is flowing a large amount of gas with some distillate.

Victoria County held wildcatting interest in South Texas Gulf Coast last week as new sand discoveries and new field projects were being tested. This area bids for an even greater amount of drilling activity in the near future to sands ranging from 2500 to 6000 feet.

W. B. Harding et al's Baass, on the west side of the Victoria structure, cored an oil sand at 3035-42 feet and then went into four feet of shale. Completed from 3035-46 feet, the well flowed at the rate of 325 barrels of pipe line oil per day through 9/64-inch choke under 920 pounds tubing and 1250 pounds casing pressure. The well, on a 35.5-acre tract, was drilled by E. Kirkpatrick. The discovery of this sand is of material importance as it appears to be a blanket proposition. The several wells drilled in the field have found the same zone, although this is the first well to attempt completion at this level. About 2 miles farther southwest, Smith et al's Stubbs 1, originally drilled to 4813 feet, sidetracked and is now recoring the shallow sand.

W. V. Bowles et al's Robertson 2, several locations north of the East Telferner field of Victoria County, was coring for the 5100-foot sand and was reportedly logging the formations about level with the pool. Three miles to the southeast, J. G. Mayo and Martin Thompson's Ragsdale 1 proved disappointing in the Heterostegina sand after the hole was plugged back from 5375 feet and sidetracked. On a drill-stem test in the new hole made at 4448-4519 feet, it recovered 900 feet of salt water in 20 minutes. It was going ahead to the 5500-foot contract depth.

Renwar Oil Corporation and John G. Mayo's Bayer 1, on the Deternal prospect southeast of Victoria, after plugging back from 6485 feet, was making a series of tests through perforations in an effort to open a new pool. First tests at 5688-91 feet developed 2250 feet of salt water in 10 minutes. A second set of perforations were made at 5780-85 feet and a drill-stem test recovered 30 feet of mud and salt water with a slight oil odor, 2430 feet of salt water and 6 pounds pressure. A new set of perforations were to be made.

Colton & Colton's Buckholz 1, Hidalgo Survey, 2 miles south of the Cologne field in Victoria County, cored a sand with oil odor at 5054-59 feet; but on a drill-stem test of 8 minutes duration, the well recovered 1110 feet of salt water.

Kirby Sharp & Fred M. Wood's Hart 1, one mile north Odem, San Patricio County, was awaiting orders at its 7500-foot contract. The well had cored several sands with oil and gas showings.

Shield Oil Company's efforts to widen the Robstown field ¾ mile to the west failed when salt water was recovered on several drill-stem tests in Nichols 1. The area is still confined to one producer. Preparations were being made to abandon the new operation at 5810 feet. It cored the sand at 5568-80 feet, and on drill-stem test at 5562-92 feet and again at 5580-92 feet, the well recovered salt water.

Yegua sand opened at Government Wells, Mirando

Laredo.—Government Wells, one of the key producing structures of the Mirando district, was materially expanded in importance as Yegua sand production was proved by the Magnolia Petroleum Company. The field already has sands in the Cole, Upper and Lower Government Wells, Loma Novia and Mirando zones. The new strike is looked upon as one of the most important since the opening of the field.

The company's C. W. Hahl 3, Section 41, on the extreme western side of the north portion of the field, cored sand section at 2890-2904 feet, about 300 feet below the Pettus zone. Drill stem test through perforations recovered oil and salt water. The well had been drilled to 3968 feet, but was plugged back to 3003 feet where a string of casing was cemented. A set of perforations at 2901-3 feet netted salt water. A second set then was made at 2890-94 feet and the well developed 230 pounds working pressure with 250 feet of salt water. A third set of perforations were shot at 2894-95½ feet, the well recovering 1080 feet of oil and 800 feet of salt water. It is believed that this salt water was the result of the soft sand breaking down while drilling, then coning while being tested.

The Magnolia Petroleum Company's strikes came two in a row. The company was finishing a producer in A. Weil 1, in the eastern portion of Section 1 and ½-mile southwest of the Loma Novia field. Bottomed at 2724 feet, the well had Loma Novia sand with good oil showing at 2710-15 feet. It further expands production in the recently-established extension area to the Hoffman field.

After several showings were encountered at shallower levels, a Standard Oil Company of Texas test cored one of the major sands of the Sejita area, Duval County, and on drill-stem test showed for a commercial well. The well is A. B. Rodriguez 1, ¾ mile northwest of the discovery and only producer. It found the sand section at 5474-97 feet and on a 9-minute drill-stem test through ¼-inch top and bottom chokes recovered 15 feet of distillate and developed 725 pounds working pressure. The 23-foot sand section is greater than any thus far found in the area, indicating that there is a thickening to the northwest. The pay is classified as being in the Hockleyensis zone.

Colorado County wildcat has little gas-distillate in Wilcox

San Antonio.—Again perforating in the Wilcox, Davis & Company's McLane 1-A, on the Garwood prospect in Colorado County, was not encouraging. The newest set of holes had been made at 9496-9527 feet, where the test was swabbing wash water with a slight show of gas and distillate. Whether salt water will break in depends to be seen in continued testing.

In Bee County, Anderson & Prichard and Mills Bennett's Robinson 1, in the West Tuleta area of Bee County, was below 7200 feet, due to start coring around 7500 feet. Bunte Brothers et al's Earnest 2, near Skidmore, had reached 5000 feet and was drilling ahead. Union Producing Company was drilling below 5300 feet on its deep operation on the Ray ranch in Bee County.

In DeWitt County, Atlantic Refining Company had exceeded 7635 feet in Conwell 1, while E. M. Jones' West 1, Live Oak County, was near 6000 feet. Sinclair Prairie Oil Company's Callaghan 1, in northeastern Webb County, was going down under surface casing.

Guadalupe County wildcat prepared for potential test

San Antonio. — Potential test was scheduled for late last week in a wildcat 2½ miles southwest of the Salt Flats field and on the same fault projected into Guadalupe County. The well, drilled by A. J. Holifield, is on the D. M. Day lease, James Hinds survey. There have been 5 locations made along this trend and in the general vicinity of the producer for tests to be this formation. The discovery is producing from the Taylor-Chalk-Buda series at 2337-2685 feet, being plugged back from 2830 feet. It is estimated at 125 barrels per day after acidizing.

A relief well is planned in Gonzales County in an effort to control the wild gas flow from Shell Oil Company's exploratory hole on the H. F. Weber tract, 4 miles southeast of Nixon. The test blew out December 23 from 680 feet and has been running wild and cratering ever since. Part of the time it was on fire.

Sam Vanderwiede's wildcat 3 miles

northeast of Shattel in Frio County, was in the top of the Edwards limestone at 5306 feet. It is A. L. Witting 1, Price Survey No. 6. Cores at this level were lost, but a small amount of formation recovered was hard with a slight stain. A drill-stem test was being run.

Texas body cancels Texas-McElroy hearing

The Texas Railroad Commission has postponed indefinitely its hearing on operating rules for the Gulf-McElroy field, which had been set for February 15 at Austin.

The commission has announced that on February 21 it will hear the applications of Staley-Wynne Oil Corporation for higher allowables on its W. T. Waggoner "F," "G" and "R" leases in Wilbarger County. This hearing was set originally for January 31.

A hearing to determine whether products of the Atlas Carbon Company are carbon black has been postponed indefinnitely. It was set for February 21.

At another hearing on February 21, the commission will discuss operating rules for the Richard King field in Nueces County and the application of Philtop Oil & Gas Company for a higher allowable on its James Dorn leases in the Luling-Branyon area of Caldwell County.

At hearing on February 23, the commission will hear applications for higher allowables in the North Thompson field, Fort Bend County, and the Clam Lake field, Jefferson County. Operating rules for the Lewis field, Jones County, and the Chappel Hill field, Smith County, will be heard at hearings later the same day.

New zones being added at Rincon, Starr County

McAllen.—Davis & Company's exploration of the Rincon structure of Starr County, expanded by new drilling contracts, is providing additional oil zones. Slick 8-B, Section 266, was being finished as a crude producer from sand at 4232-42 feet, showing an estimated 350 barrels of crude through ¼-inch choke. This sand is productive in several other wells. Slick 9-B, same survey, was attempting completion through perforations at 3727-33 feet. The company has 5 other locations in the field.

Two wildcats in the northern portion of Star County are holding much attention at this time. Royal Oil & Gas Company's Juarez 1, 6200 feet west of the south end of the Kelsey pool, was coring below 4786 feet, not looking too encouraging. Sun Oil Company's Rodriguez 1, 8 miles southwest of the Kelsey pool, after coring a series of sands with oil and gas showings, was coring below 5540 feet, apparently in the upper Jackson formation.

Deep exploratory work is apparently on the increase. In Cameron County, Pure Oil Company has made two tentative locations for 10,000-foot operations near the Brownville ship channel and on a large block held by this company. Falcon Seaboard Drilling Company is expected to drill both wells.

Hidalgo County's deep wildcat being drilled on the Ogg tract by Humble Oil & Refining Company about 5 miles south of McAllen, is awaiting orders to proceed below 7750 feet. Gulf States Oil Company's Cardenas 2, at San Salvador in this county, is near 8000 feet on a 10,000-foot contract.

Texas Gulf Coast

Chambers County wildcat has salt water in Frio sands

Houston.—Three miles north of Cedar Point, Chambers County, George Anderson's Lawrence 1, W. D. Smith Survey, flowed salt water during a production test in Frio sands. Operators perforated casing with 48 shots at 7126-35 feet and hung 2½-inch tubing at 7045 feet. The wildcat was washed and started flowing salt water with a slight green scum. Tubing sanded up, and when hole was swabbed, the swab was lost in the tubing. It then flowed through the casing and continued to make salt water. Lawrence 1 was drilled to 7215 feet, plugged back and 5½-inch casing was set at 7199 feet. Cores from 7131 to 7135 feet showed a slight show of oil.

Northwest of Manvel, Brazoria County, S. E. W. Oil Corporation's L. P. Van Werder 1, A. C. H. & B. Survey, cored broken sands with odors of gas. Hole is bottomed at 4310 feet, and will be carried to contract depth of 7500 feet. The wildcat cored a sand at 3390-3450 feet with a gas odor. At 3709-12 feet it had another broken sand with a gas odor; at 3712-20 feet it had sand with a gas odor and a show of salt water, with the same in a core at 3720-28 feet. Cores at 4184-92 feet had sand with a gas odor, and at 4192-4200 feet had sand with no shows.

In the Pearland area, Brazoria County, where a number of wildcats have been abandoned after proving structure, McDannald Oil Company located Hatfield 1, on a 15-acre tract in the R. B. Lyle No. 4 Survey.

To Test

Glenn H. McCarthy's Salmon et al 1, 2200 feet northwest of production at Anchor, Brazoria County, was preparing to set a new cement retainer at 10,499 feet. A production test will be made the coming week. The outpost showed 6 barrels of fluid per hour, 50 percent salt water and 50 percent oil, when a test was made at 10,495 feet. Sun Oil Company has announced its first location at Anchor. Stern 1 is on a 138-acre tract in the S. Marsh Survey.

South of El Campo, Wharton County, H. C. Cockburn's Reitz 1, E. T. R. R. Survey No. 59, was coring in shale at 6060 feet after logging salt water sands at 5999-6004 feet.

J. F. Hutchin's Borden 2, Mackay area, E. M. Cox League, Wharton

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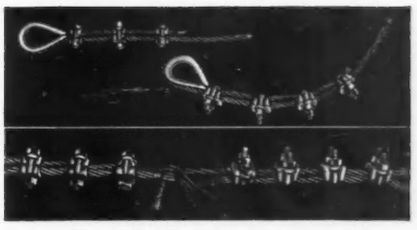

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County, was opened last week and it made 4½ barrels of distillate daily through ⅛-inch choke with tubing pressure of 1850 pounds. Casing was sealed. The gas/oil ratio was 145,000 to 1. Borden 2 is credited with opening the first producing field this year in the Texas Gulf Coast. It was perforated at 4758-71 feet.

On the flank of Big Hill dome, Matagorda County, Marrs McLean has abandoned Gulf-Tex Oil Company 1, I. Ingram Survey, at 4443 feet. The well tried to blow out at 4441 feet and special drilling mud had to be pumped into the hole. Sand and shale with an odor of gas was cored at 4141-43 feet.

West of production 1000 feet at Lovell Lake, Jefferson County, Humble Oil & Refining Company completed Todd 4, W. Carr Survey, flowing 9 barrels of pipe line oil per hour through ¼-inch choke from 7724 feet.

Titantic Oil Company's second well on the northeast side of South China field, Jefferson County, was completed. Guiterman B-1, C. T. Gaylor Survey, flowed 7 barrels of oil per hour after casing was perforated at 7518 feet.

Jefferson Lake Sulphur Company's Proebstle 12, Clemmons Sulphur dome, J. McNeel Survey, Brazoria County, had a show of oil last week. This is the first sulphur test drilled by the operators which has logged a show of oil. Limestone with good shows of oil were cored at 1049-59 feet, 1059-64 feet, 1064-66 feet and at 1066-71 feet.

Deepen at Rosenberg

Humble Oil & Refining Company's first well at Rosenberg, Ft. Bend County, was preparing to deepen from 8499 feet after cementing surface casing. Miller 1, L. E. Cross Survey, topped a sand which had a slight gas show and returns were lost. Surface casing had parted and was cemented again. Miller 1 has logged several sands up the hole with shows of gas and distillate. This company is deepening in Bassett Blakley 1, Danbury area, Brazoria County, after failing to make a producer at 5700 feet. It was drilling below 6025 feet in shale. The well is seeking a new sand for the field.

Amerada Petroleum Corporation and Stanolind Oil & Gas Company are preparing to drill a deep wildcat on the Wadsworth prospect in Matagorda County. Location was made for General American Life Insurance Company 1 in the center of Lot 12, Block 8 of the subdivision in the J. C. Peyton Survey.

Gulf Oil Corporation's Phoenix Development Company 115, deepest well ever drilled at Hull, was abandoned last week at 8166 feet in salt, topped at 8113 feet. The hole was used for geophysical work before it was abandoned. It had a show of oil around 6250 feet.

Ask Texas commission for 3800-barrel Anahuac increase

Royalty owners in the Anahuac field requested an increase of 3821 barrels in daily allowable at a hearing before the Texas Railroad Commission last week. Present allowable is 6179 barrels daily, an average of 20.3 barrels per well.

Nominations filed totaled 14,700 barrels daily for February. Royalty owners said that other Gulf Coast fields have allowables averaging 29 barrels per well.

Ed Hamner, Humble Oil & Refining Company geologist testifying for the royalty owners, said the field was not entirely defined, and presented evidence to show that the additional oil could be produced without waste.

Cumulative production in the field January 31, 1940, was approximately 13,000,000 barrels, and pressure has dropped only 85 pounds since the field came in. It was estimated that 118 years would be required to deplete the field on the present basis of production.

Hearings for Mauritz, Pearsall and Plymouth fields

The Texas Railroad Commission has scheduled a hearing for February 24, at Austin, to consider a higher allowable for the Pearsall field, Frio County. At hearings on February 26, increases for the Mauritz field, Jackson County, and the Plymouth field, San Patricio County, will be considered.

Ask 20,000 barrel increase in allowable for Conroe

An allowable of 42,000 barrels daily for wells in the Conroe field was requested by operators at a hearing before the Texas Railroad Commission last week. The February allowable is 20,597 barrels a day, an average of approximately 22 barrels per well.

Testimony at the hearing showed that pressure increased since 1936, and has leveled out consistently since the latter part of 1937. For this reason, operators contended additional oil could be produced without waste.

Through October 31, 1939, the field had produced 106,263,812 barrels, and the estimated reserve remaining is 544,000,000 barrels. Operators said it would take about 72 years to recover the remainder of this oil.

Tide Water Oil Company presented testimony to show that allowables represent about 50 percent of nominations by purchasers. American Liberty Oil Company also joined in the request for additional oil from the standpoint of market demand.

Louisiana Gulf Coast

Ville Platte outpost prepared for production test

Lake Charles.—Southeast of production at Ville Platte, Evangeline Parish, Danciger Oil & Refining Company was preparing a production test on Vidrine 1, Section 1-4s-2e. Hole is bottomed at 10,244 feet in salt water sands, topped at 10,195 feet. Six-inch casing has been set on bottom. Electric log showed 12 percent oil saturation in sands at 10,152-180 feet. Sands at 9904-15 feet and at 9968-90 feet showed gas and distillate.

Tide Water Associated Oil Company made another drill stem test on Delta Farms 1, Delta Farms area, Lafourche Parish, last week and recovered gas and distillate. The operator has cemented perforations at 8750-60 feet, where the test was made. The test showed 100 feet of distillate and a 2200 pound pressure in 29 minutes through ¼-inch chokes.

At West Lake Verrett, St. Martin Parish, Shell Oil Company's Jeanerette Lumber Company 4 was drilling below 10,864 feet after running 7⅝ inch casing to 10,683 feet. The test has cored several new sands for the field, and if no new sands are found deeper, it will be plugged back and tested for production.

Test New Sand

W. T. Burton will attempt to open a new producing sand, the deepest for Starks field, Calcasieu Parish, the coming week. Industrial Lumber Company 1, Section 29-9s-1w, is bottomed at 7420 feet, and cement has been drilled out to 7350 feet. The hole will be tested in oil sand which was cored around 7336-49 feet and at 7316-26 feet. It had gas sand around 7219-26 feet, and blew out some time ago.

Republic Production Company has completed Lutcher Moore 4 at Bancroft, Beauregard Parish, in the Sparta sands after drilling to the Wilcox. Hole was bottomed at 10,019 feet in shale, and plugged back and perforated with 24 shots at 7284-90 feet. It came in flowing 75 barrels of 45 gravity oil in 15 hours.

Continental Oil Company may deepen Niblett 1, Niblett Farms area, Section 1-11s-5w, Jefferson Davis Parish. The hole is bottomed at 10,236 feet in shale. Side wall cores taken at 8562 feet, 8570 feet and 8578 feet failed to show anything of commercial importance.

Amerada Petroleum Corporation's Glaze 8, Eola, Avoyelles Parish, Section 6-2s-3e, logged 30 feet of Cockfield oil sand last week at 6438 feet, but is being carried on down to the regular Wilcox oil sand at 8500 feet. Several wells at Eola have cored the Cockfield oil sands but none have been completed in that formation.

Thick Sand

On the flank of Jennings field, Acadia Parish, Shell Oil Company's Community 9 is bottomed at 7580 feet after running an electric log that showed oil sands at 7207 to 7487 feet and at 7507-37 feet. This is one of the thickest sands that has been found at Jennings. Operators will probably core deeper this week.

Glassell & Glassell have made their second location on the flank of Anse La Butte in St. Martin Parish. Breaux 2 is 370 feet south and 720 feet east of Breaux 1, which opened a new sand for the old salt dome a week ago. It is in Section 118-9s-5e.

Humble Oil & Refining Company has located a wildcat on the Branch prospect, Acadia Parish. Meche Leger 1 is in Section 83-8s-2e. H. M. Naylor has located a wildcat on the Mermentau prospect in Jefferson Davis Parish. Acadia Development Company 1 is in Section 12-10s-2w. Continental Oil Company controls several hundred acres in this area, and has drilled one deep test to 10,935 feet where it attempted to blow out. The deep dry hole showed gas at 10,097 feet.

North Louisiana

Fourth oil well at Sugar Creek encourages drilling

Shreveport.—The fourth oil well for the Sugar Creek field, Claiborne Parish, which has produced wet gas for several years was completed last week at Sugar Creek Syndicate's Robinson 1, NE NE SE 32-20n-5w, flowing 675 barrels of oil daily on ½-inch choke after perforating casing at 5745-60 feet in the Travis Peak. Total depth is 5816 feet. The well showed casing pressure of 600 pounds and tubing pressure of 50 pounds. After filling two 500-barrel tanks the well was shut in for connections. This is expected to lead to the drilling of additional Travis Peak tests for oil around the flanks of this dome.

The shallow Pine Island field continues to hold the lead in new producers adding three shallow oil wells last week. Two small gas wells were completed in the Monroe field.

Harry Hanbury's Holstun Unit 1, NE SW NE 29-18n-6w, Bienville Parish wildcat, with elevation of 277 feet, logged base of massive anhydrite at 5536 feet and picked up 18 feet of soft material at 5585 feet, corresponding to the Davis sand in a gas-distillate field in the same parish.

Louisiana permits

Sixty drilling permits were issued last week by the Louisiana Conservation Commission of which 16 were in North Louisiana divided among the following parishes: Caddo, 10; La Salle, 1; Sabine, 1; Union, 3; and Webster, 1.

The 44 in South Louisiana were in the following parishes: Acadia, 1; Avoyelles, 5; Beauregard, 2; Cameron, 2; Evangeline, 4; Iberia, 4; Iberville, 1; Jefferson, 1; Jefferson Davis, 3; La Fourche, 5; Plaquemines, 3; St. Martin, 1; St. Mary, 11; and Terrebonne, 1.

Mississippi

Tinsley Dome completion again extends productive area

Jackson, Miss. — Two wells were completed last week in the Tinsley Dome field, Yazoo County, one of them ½ mile east of a 1¼-mile north extension. The latter is Union Producing Company's Stevens 9, SW SW 1-10n-3w, completed at 4793 feet from 20 feet of sand, flowing 70 barrels of oil per hour. Casing was perforated with 110 shots from 4723-53 feet and from 4758-68 feet with 50 shots. The well was washed in flowing through ½-inch choke with tubing pressure 160 pounds and casing pressure 140 pounds.

Fred E. Courson and associates' Bailey 1, SW SW NE 4-6n-18, Jefferson Davis County wildcat, ran electrical log to bottom at 6012 feet in hard sandy shale, and is idle.

Three new locations were made in Yazoo County of which two were by T. B. Slick for outside tests at Tinsley Dome, Fee 1, C SE NW 11-10n-3w, and Fee 2, C NE NW 11-10n-3w. A wildcat location in Yazoo County was made by Nelson Brothers at Stoner 1, SE NW 2-11n-5w.

Stanolind Oil & Gas Company has secured a geophysical option on 30,000 acres in Township 4, Ranges 11 and 12 east, Jasper County, from C. C. Bishop of Houston. C. M. Dorchester has leased 4000 acres in Townships 7 and 8 east, Ranges 5 and 6 east, Rankin County. L. W. Whittington has leased 11,000 acres in Township 10 north, Ranges 3 and 4 east, Madison County. The California Company, Gulf Refining Company, Sun Oil Company and Love Petroleum Company are leasing in eastern Rankin and western Scott counties and in an area where Gulf Refining Company recently moved 36 engineers and geophysical crew men.

Royal Oil Company of Philadelphia, and Tatum, Dunbar and Shaddock of Jackson, have completed shooting a 12,000-acre block in Township 5 north, Range 2 west, Hinds County, and plan a 6500-foot test to start by next April 2. H. L. Hunt leased 3000 acres in Township 14 north, Range 7 east, Attala County. In Scott County, The California Company leased 7000 acres in Township 8 north, Ranges 5 and 6 east, and in the same township and in Ranges 5, 6 and 7 east, Gulf Refining Company leased 15,000 acres. Sun Oil Company leased 2000 acres in Township 8 north, Range 6 east.

Michigan

Two wells add 350 acres to South Overisel pool

Mt. Pleasant, Mich.—Extensions expected to add from 200 to 350 acres to the south end of the South Overisel pool, Allegan County, were developed this week as the principal accomplishment in shallow field drilling. At the same time, definite barriers to farther extensions north of the Walker-Tallmadge field were defined.

Attempts to produce a Traverse lime pay horizon at 1865 feet were sidetracked and Strom & Shiffmans' Lund 1, Section 15-11n-16w, Muskegon County wildcat, will be carried deeper for a Dundee-Monroe test. It pumped down to about 3 barrels a day after the first four days and cut 20 percent water.

Wiser Oil Company's Jurries 1, SW NW SE 34-4n-14w, Overisel Township, Allegan County, flowed and pumped 200 barrels after acid treatment from Traverse at 1427 feet to extend the South Overisel pool better than ¼ mile south. Meanwhile, Sprenger Brothers' Gravel-ing 1, SW NE SE 34, developed 35 barrels natural production at 1525 feet to extend the proven area ¼ mile farther southeast.

Seaboard Oil Company logged an oil show in Monroe limestone at 2290 feet on the Martin 1 wildcat, Section

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17-5n-10w, Caledonia Township, Kent County, which was regarded as a significant development although the test was later junked at 2301 feet. It was the first test in the Kent district to show saturation below the Traverse lime formation. Seaboard logged Traverse at 1934 feet, Dundee at 2225 feet and Monroe at 2269 feet.

Two semi-wildcat tests drilled commercial gas pays in the Michigan Stray sand for the chief Basin developments for the week. E. C. Dailey completed Church 1, Section 17-12n-5w, Montcalm County, for 6,230,000 cubic feet at 1215 feet. Wicklund Development Company's Leosh 1, SE SE SE 8-16n-3w, on the north end of the Wise oil field, developed an estimated 7,000,000 to 15,000,000 cubic feet at 1267-72 feet. This hole will be carried on to the 3700-foot Dundee zone for an oil test.

Wicklund Development Company has junked State A1, Section 11-18n-1w, Buckeye Township, Gladwin County, at 4696 feet without reaching the original objective, Sylvania, projected around 4800 feet.

C. L. Maguire, Inc.'s Clark 1, Section 32-16n-2w, Warren Township wildcat, Midland County, was still being deepened this week at 4135 feet. Dundee top was logged at 3726 feet. No oil shows had been logged at the last reported depth.

New Mexico

Two Lea County lime pools get attractive edge wells

Hobbs.—Outpost tests for two lime pools in Lea County registered outstanding completions the past week. The Rhodes oil and gas area was given its largest producer and a southeast extension when The Texas Company et al's Rhodes 1-B, NE SW NE 27-26s-37e, flowed an average of 42.2 barrels high-gravity oil hourly on 6-hour test. Broken saturation at 3119-3280 feet was shot with 320 quarts of nitro to attain the steady flow. It is midway between the pool discovery and a small oil producer drilled by Ohio Oil Company near the Texas border, but the latter well declined to the stripper stage shortly after completion.

Renewed interest in the prolific lime pool, situated between the Eunice and Penrose fields resulted from completion of Gulf Oil Corporation's Christmas 3-C, C W½ SW NE 18-22s-37e, flowing 1100 barrels of oil natural in 12 hours. The hole is bottomed at 3720 feet, or 299 feet subsea. It is the most southeasterly producer. The same company's Mattern 3-D, SW SE NW 7-22s-37e, is reported to be flowing water with oil after using acid at 3750 feet, or 302 feet subsea. Water has made its appearance in other nearby wells, but it is believed to be a stray water zone, as it declines in volume.

Pumping gauge given Argo Oil Corporation's State 1, north offset to the discovery of the Halfway pool, western Lea County, rated the output at 25 barrels of 28-gravity oil hourly without materially lowering the fluid level. Production is from 2 feet of saturation, topped at 2625 feet. Rig has been skidded one location west to drill an offset to the company's earlier completion.

Operations in Lea County continue to rise in volume. Total of 10 tests were listed the past week, or double the quota of the preceding week. The Penrose field and the prolific lime area adjoining on the west accounted for 5 of the operations, including E. G. Rodman, and J. C. Clower's State-Humble 1, SE NE SE 29-22s-37e, which is on a 120-acre farmout by Humble Oil & Refining Company.

The High Lonesome district, northern Eddy County, is adding a new oil horizon in an area that may prove to be a separate pool. C. B. Buck et al's State 1, SWc 31-16s-29e, ½ mile west by north of a small gasser at 2431-38 feet, flows by heads when agitated by pump after 130-quart nitro shot at 2110-48 feet, having plugged back from 2652 feet. It is rated at 150 to 200 barrels daily.

Rocky Mountain States

New sand in West Ferris field provides first Wyoming strike

Casper, Wyo.—First 1940 new oil sand discovery for the Rocky Mountain area is apparently in the West Ferris field, Carbon County, southern Wyoming, where Sinclair-Wyoming Oil Company reports 17 feet of saturated Pennsylvanian in its 4-E, CSE SW 29-26n-87w, first well in the field to be drilled below the Sundance (Jurassic) formation. It had top of Tensleep at 4274 feet and has cemented 7-inch production string at 4273 feet. Bottom is at 4292 feet in saturated sand. The test is shut down waiting on erection of two 1000-barrel storage tanks to be used in production test.

The West Ferris field, midway between the Mahoney Dome and Ferris fields, has commercial gas production in the Dakota and Sundance sands but to date has not been tested in the underlying horizons. Both of the flanking fields have developed prolific production in the Tensleep sand, bolstering belief that a good well will be completed in that horizon in the central field on the general uplift.

Preliminary work is completed and operators are waiting on moderating weather conditions before spudding in on Shawnee Exploration Company's Robert Salisbury 1, SW NE 27-32n-69w, proposed deep test to the Shannon and Frontier sands of the Shawnee field, Converse County, east central Wyoming. Rig is up on location and fuel and water lines laid. It will be the first deep test on the structure, as defined by magnetometer survey, in the area north of the major fault in the field. A number of shallow oil and gas wells have been completed at the Tertiary-Cretaceous contact levels, but no conclusive test has been drilled to the probable source beds in the lower formations.

Following completion of another good edge well on the southwestern side of the Lance Creek field, largest producing district in the Rocky Mountain territory, Minnelusa Oil Corporation located Mackinnie-Thompson 8, CSW NE NW 7-35n-65w, an east offset to C. L. Price's Lamb 2, present outpost producer on the western slope of Lance Creek.

Lance Creek continues to be the most active producing district in the state. Fourteen wells reported active in the area last week. One of the most important wells drilling is Ohio Oil Company's Rohlff 6, SE NW NE 32-36n-65w, outside location on the northwest side of the producing area. It was drilling ahead below 3701 feet, with the ojective sands in the Minnelusa series of Pennsylvanian age.

The north side of the LaBarge field, Sublette County, western Wyoming, is getting further attention. Marvel Oil Company's Government 1-H, CEL NE¼ SE 28-29n-113w, was spudded last week. It is on the proved sector of the structure in a district which has seen considerable activity during the past several months.

Winter weather continues to hold down many field operations in the district. Important extension test of the LaBarge field, Sublette County, North LaBarge Oil Company's Government 1, SWc NE SE 23-27n-113w, is waiting on warmer weather before deepening from 1440 feet where it shut down after repairing equipment early this year. Heavy snows and cold weather have hampered moving of supplies in this territory.

Activity is also suspended temporarily on Bruce C. Teeters' State 1, SWc SW NE 36-42n-61w, north extension test in the Dewey Dome field, Weston County, northeastern Wyoming. Well has been drilled to 2270 feet, top of the Leo sand, where it is shut down. Operators plan to resume about April 1, and will carry hole ahead to test the Leo, and possibly the Bell sands of the Minnelusa series. Both horizons are commercially productive in the Lance Creek field to the south, and the Bell horizon recently showed for commercial production in the Mule Creek field some 15 miles south of Dewey Dome.

California

Valley test below 13,500 feet; may set depth record

Los Angeles.—Shell Oil Company's KCL 2A-52-13, Section 13-11-22, in the San Emigdio area of San Joaquin Valley, was making hole last week below 13,500 feet and gathering interest as a possible record-depth test. It has 9⅝-inch casing set at 10,297 feet, and hole is reported in excellent condition. The bit is still in the Miocene.

Present depth record is 15,004 feet, held by Continental Oil Company's KCL A-2, Wasco field, Kern County, California, and completed in 1938.

In the East Coalinga field, Superior Oil Company has located B-2, Section 6-20-16, at the east end, and has effected water shut off in Cagle 4, same section. The latter test was coring below 7600 feet. Standard Oil Company of California's 42-19F, Section 19, 3 miles distant, topped the Eocene zone and was drilling deeper.

UNITED STATES WELL COMPLETIONS

Arkansas

Company, Well and Location	Init. Prod. Bbls.	Depth
Columbia County (Magnolia)—		
Normadie Oil Co., Crumpler 1, 18-17-19	600	7521
Shell Oil Co., Inc., Lewis 2, 19-17-19	640	7622

California

Company, Well and Location	Init. Prod. Bbls.	Depth
Los Angeles County (Dominguez)—		
Shell, Reyes 13	600	4277
Union, Carson 13	175	7784
(Long Beach)—		
D. D. Dunlap, No. 14	175	3875
(West Montebello)—		
Gus Pongrantz, Brown 1	385	7620
Stag Oil Co., Brown 1	450	7617
Star Pet. Co., Allen 1	385	7500
(Wilmington)—		
Continental Corporation, L.A.C.F.C. D. (LB) 2	600	2981
General, Blinn (LB) 8	68	3355
Royalty Service Co., Chadwick 1	388	3604
Union Pacific, UP (LB) 130	962	3477
Wilton Oil Co., No. F-55-10	620	3696
(Seal Beach)—		
Asphalt Pet. Co., Rancho 1	*	5158
Kern County (Trico Area)—		
Standard, Bolz 2	¶13	2486
Trico Oil & Gas, Bryson 1	¶25	2500
(Canal)—		
Ohio, KCL E-17	1770	8330
(Coles Levee)—		
Ohio, KCL F-6-47-11	450	10,000
Union, KCL-54-11	129	10,192
Kern County (Mountain View)—		
Universal Consolidated, Cattani 2	970	6149
(Devils Den)—		
Texas Co., Beer 2	*	1202
(McKittrick)—		
Calstan Pet. Co., Webber 1	*	1220
Fresno County (East Coalinga Eocene Pool)—		
R. S. Lytle, No. 5-7F	2056	6931
No. 24-7F	1860	7120
(Midway-Sunset)—		
Merritt Annex Oil, Fried 8	37	2495
Texas, No. 37	104	3209
(Coalinga-Shallow Area)—		
Migs Oil Co., No. 8	*	232
Ventura County (Santa Maria Valley)—		
Union, Russell-Lollier 1	131	4595
(San Miguelito-Padre Canyon)—		
C.C.M.O., Hobson A-8	105	6450
(Ventura Avenue)—		
Tide Water Associated, Lloyd 120	959	9190

Illinois

Company, Well and Location	Init. Prod. Bbls.	Depth
Clay County—		
Pure, Smith 12, sw nw sw 7-2n-8e	265	3060
Clinton County—		
W. A. Martin, Wiggens 1, lot 24, blk 2, 13-1n-1w	288	2908
Mid-Western States Oil Co., Panzau 1, lot 22, blk 2, 13-1n-1w	392	2909
Tom Potter, Shosick-Bailey 1, lots 15 & 16, blk 2, 13-1n-1w	*	1910
Spitznagle & Moore, Meisenheimer 1, nw sw se ne 13-1n-1w	*	1548
Taylor Dr. Co., Heiss 1, se ne nw ne 13-1n-1w	498	2911
Williams et al, Ellerman 1, 134 ft s of nw se sw 36-2n-1w	18	1377
Cascade, Adams 4, se ne se ne 13-3n-1w	*	1465
Fayette County—		
Sherman et al, Garver 2, sw ne ne 25-6n-2e	96	1572
Ohio, Rush 5, 80 ft e of se nw sw 30-6n-3e	152	1556
Schwarm et al 1, 80 ft w of sw se sw 30-6n-3e	115	1616
Zephyr Dr. Co., Smith 2, se sw se sw 31-6n-3e	100	1633
Carter Oil, Durbin 12, nw ne ne 8-7n-3e	79	1581
Shelton 3, sw nw nw 9-7n-3e	168	1545
Harper 3, nw sw nw 17-7n-3e	114	1560
Shell, Harper 4, 55 ft n of nw se ne 18-7n-3e	69	1595
Minerva Oil Co., Richardson 5, ne ne nw 21-7n-3e	104	1548
Carter, Griffith 12, se nw ne 31-7n-3e	294	1560
Gulf, Wilhelm 5, sw sw sw 32-7n-3e	140	1592
Carter, Brooks-Hopper 2, se sw ne 23-8n-3e	756	1530
Dunaway 4, ne ne se 29-8n-3e	1038	1589
Minerva Oil, Tish 12, nw ne se 33-8n-3e	65	1526
Gallatin County—		
Skelly-Exchange et al, Hale 1, ne ne ne 21-7s-9e	*	3100
Marion County—		
Texas Co., Bundy 6, nw sw nw ne 6-1n-2e	597	2032
Max Pray, Cole 5, ne ne nw se 16-2n-2e	25	2085
Tomberlin, Young Hrs. 2, nw se ne se 20-2n-2e	74	2226
Texas Co., Young 20, sw c nw 21-2n-2e	2106	3465
Magnolia, Shanafelt 36, nw ne se sw 29-2n-2e	6969	3414
Mitchell, Lee 5, sw nw se ne 29-2n-2e	6690	3424
Texas Co., Friedrich 14, 40 ft n of sw nw nw 29-2n-2e	252	2103
Maxwell 6, c w½ ne se 30-2n-2e	91	2050
Maxwell 7, 50 ft s of se ne se 30-2n-2e	252	2012
Richland County—		
Pure, Pflaum 3, ne ne ne 5-3n-9e	190	2591
Glossbrenner 4, 264 ft e of nw sw nw	564	2900
Wabash County—		
Vickers Pet. Co., Burns 5, 130 ft n of ne nw sw 9-2s-13w	120	2440
Marvel Oil Co., Beall 2, sw nw se 11-2s-13w	15	2741
Continental, LeGier 1, ne nw se 17-2s-13w	79	1795
Schultz 4, nw nw ne ne 17-2s-13w	72	2424
Magnolia, Batson 4, nw se se 17-2s-13w	*	2580
H. A. Reckas et al, Elkins 2, sw nw nw ne 29-2s-13w	*	2512
Washington County—		
Magnolia, Francis 12, nw sw ne 22-3s-3w	5	1308
Shell, Goodner 1, sw nw nw ne 26-3s-3w	44	1272
Wayne County—		
Pure, Hubble 2, c e½ nw sw 4-1n-8e	59	3128
Hubble 2, nw se nw nw 4-1n-8e	169	3135
Gill 2, nw se sw ne 24-2n-7e	559	3090
Gill 1, se ne ne 25-2n-7e	77	2993
Randall et al, Horton 1, se se se 12-3s-9e	*	3413
White County—		
Superior, Ford 14, nw sw se sw 4-5s-14w	100	2196
J. W. Carter et al, Johnson 1, sw nw ne 25-6s-8e	635	2528
Skelly, Storms 3, sw nw sw 14-6s-9e	330	2254
Blackstock, Storms 5, 55 ft e of sw ne ne 23-6s-9e	350	2268
Hollingsworth, Felix 1, sw se sw nw 20-3s-8e	81	3257
Etheridge & Porter, Watson 1, ne nw sw ne 20-3s-8e	*	3366
Jack Wood et al, Jackson 1, ne nw sw 20-3s-8e	110	3253
H. H. Weinert, Miller et al 2, c n½ sw nw 29-3s-8e	75	3434

Indiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Gibson County—		
Longhorn Oil, McCarthy 1, c nw se nw 13-2s-11w	*	1014
J. E. Crosbie, Keck 4, sw nw sw ne 34-3s-14w	20	2822
Continental, Kleider 1, ne nw nw 35-3s-14w	164	2512

*Failures; †Junked; ¶Million cu. ft. gas.

Summary of Drilling Operations in the United States, Week Ending February 17, 1940

	WELLS COMPLETED							PERMITS FOR NEW WELLS*				
	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1940	Total this Date 1939	This Week	Total this Month	Total 1940	Total this Date 1939	Year Total 1939
Alabama	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	2	2	.....	.....	1,240	26	37	.....	3	10	21	223
California	28	22	2	4	13,379	196	145	19	55	152	146	1,136
Colorado	.....	.....	.....	.....	.....	2	2	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois*	55	47	.....	8	25,443	488	601	55	196	572	.....	893
Indiana	5	3	.....	2	196	60	18	.....	.....	.....	.....	.....
Kansas	25	22	1	2	36,871	213	175	29	87	204	178	1,583
Kentucky	1	.....	.....	1	.....	37	107	.....	.....	.....	.....	.....
Louisiana	19	14	2	3	3,781	226	132	60	105	187	146	1,449
Michigan	24	17	.....	7	2,690	195	157	31	.....	211	129	1,419
Mississippi	4	2	.....	2	1,900	24	1	.....	.....	.....	.....	.....
Missouri	2	.....	.....	2	.....	4	.....	.....	.....	.....	.....	.....
Montana	2	2	.....	.....	284	22	14	.....	.....	.....	.....	.....
Nebraska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Mexico*	12	10	.....	2	3,645	112	97	15	34	103	.....	293
New York	26†	22†	1	3	87	151†	75†	.....	.....	.....	.....	.....
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	10	6	4	.....	32	140	130	.....	.....	.....	.....	.....
Oklahoma	30	22	3	5	11,285	290	261	25	95	254	258	2,059
Pennsylvania	46†	39†	3	4	43	383†	184†	.....	.....	.....	.....	.....
South Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	136	100	3	33	58,390	1,413	1,477	31	541	1,509	1,433	10,269
Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	10	8	2	.....	3	104	77	.....	.....	.....	.....	.....
Wyoming	1	1	.....	.....	180	23	30	.....	.....	.....	.....	.....
Total this week	438	339	21	78	159,359	4,071	3,721	265	1,174	3,204	2,311	18,752
Total last week	450	319	29	102	180,264	3,633	3,178	377	909	2,941	1,922	18,752
Total this year	4,071	2,925	261	885	1,436,425	.....	.....	.....	.....	.....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Illinois date from October 15, 1939; New Mexico from August 1, 1939.
† Includes water-input wells.

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Martin County—		
Pioneer Dr. Co., Meyer 1, ne ne sw 26-2n-4w	*	2250
Marion County—		
J. M. Seip, Brock 1, sw se sw sw 6-16n-6e	12	1007

Kansas

Barton County—		
Barnsdall, Rous 2, c s½ ne sw 28-16-11w	3000	3347
Stanolind, Panning 22, c n½ nw se 10-20-11w	*	3337
Butler County—		
Cities Service, Thinney 1, se nw se 4-26-5e	17	2630
Cowley County—		
Mitchell Dr. Co. et al, Bachelder 1, csl se ne sw 27-30-6e	*	3350
Texas Co., Ross 3, nw se se 21-34-4e	3000	3301
Ellis County—		
Shell, Rumsey 31, se sw ne ne 23-11-17w	3000	3441
Cities Service, Colahan 7, ne sw nw 24-11-17w	3000	3413
Skelly, Kempe 2, ne nw ne 12-11-18w	3000	3430
Lario, Winsor 1, c n½ sw sw 11-12-18w	1695	3682
Greenwood County—		
Shaffer et al, Souder 8, c e½ nw se 16-23-13e	15	1725
Kingman County—		
Skelly, Mills "A" 7, c ne 30-27-10w	†87.25	3972
McPherson County—		
Central Pet. Co. et al, Swanson 1, c n½ nw nw 18-20-5w	1383	3348
Mid-Continent, Peterson 1, c w½ sw sw 29-20-5w	3000	3363
Continental, Mattson 4, c n½ nw nw 31-20-5w	342	3371
Prunty et al, Jones "B" 1, nwc sw 32-21-1w	714	3295
Rice County—		
Bishop Oil Co., Cramm 2, nw ne sw 15-19-9w	17	3229
Meridian Oil, Inc., Johnson 2, c n½ nw se 31-20-7w	904	3320
Schneider et al, Renollet 2, sw ne se 36-20-8w	3005	3317
Rooks County—		
Republic Nat. Gas Co., Riddler "B" 1, c e½ se se 36-10-18w	3000	3498
Russell County—		
McBride, Jellison 5, nwc sw 19-13-14w	845	3270
Skelly, Opdycke 10, c s½ se nw 29-14-13w	940	2940
Hayes et al, Vonfelt 1, nwc 6-15-14w	619	3075
Cities Service, Bender "A" 8, cel ne nw nw 25-15-14w	1131	3329
Podszus 5, swc 25-15-14w	1244	3325
Stafford County—		
Deep Rock, Turner 1, c s½ sw sw 2-24-11w	3000	3748

Kentucky

Daviess County—		
I. C. Huff et al, Ambrose 1	*	1265

North Louisiana

Caddo Parish (Pine Island)—		
Hugh Carney, Burton 1, 1-20-16w	100	1495
E. E. Marr, Brown 1, 11-20n-16w	25	1600
L. L. Sugar, Muslow B-1, 32-21n-15w	150	1586
Claiborne Parish—		
Sugar Creek Synd., Robinson 1, 32-20n-5w	675	5816
Union Parish (Monroe)—		
Memphis Nat. G. Co., Langford 4, 3-21n-3e	¶1	2200
Langford 9, 26-22n-3e	¶2	2200

South Louisiana

Abbeville—		
Continental, Francois 1	176	7908
Stanolind, LeBouef 1	*	8208
Charenton—		
DeArman, Landry 13	292	961
Simoneaux 11	39	870
Pan American, Robichaux 7	*	2505
Robichaux 17	46	954
Bancroft—		
Republic, Lutcher Moore 4	120	10,019
Bateman Lake—		
Texas Co., State 3	355	10,867
Eola—		
S. Richardson, Haas 8	777	8590
Gillis—		
Union Sulphur, Castle 11	300	7093
New Iberia—		
Wm. Helis, Schwing 7	*	8850
North Crowley—		
Humble, Stakes 4	403	8830
Ville Platte—		
Continental, A. Tate 3	323	9033

Michigan

Allegan County—		
Bell-Marks, Inc., Brower 3, ne se nw 23-3n-12w	*	1681
Norton & McRees, McKennon 1, ne nw nw 32-3n-12w	*	1659
Fortney Oil Co., Hove 3, se se nw 27-4n-14w	130	1457
Wiser Oil Co., Jurries 1, sw nw se 34-4n-14w	100	1419
Goulf & Cross, Rigterink 1, sw ne sw 34-4n-14w	175	1438
Fletcher-Leman, Schapp 2, se nw sw 34-4n-14w	500	1437
Socony Vacuum, Sutter 1, ne ne sw 2-4n-13w	350	1652
N. R. Dodd. Kleinsteker 1, nw sw nw 10-4n-13w	*	1672
Clare County—		
Pure, Bicknell B2, c s sw nw 27-19n-6w	50	3912
Gladwin County—		
Wicklund Dev. Co., State A1, sw sw se 11-18n-1w	*	4696
Kent County—		
Seaboard, Martin 1, ne ne sw 17-5n-10w	*	2301
Twin Dr. Co., Lincoln 1, nw ne sw 20-7n-12w	*	1947
Gordon Oil Co., Dykstra 3, ne se ne 30-7n-12w	85	1926
C. A. Welsh, Marcellus 2, ne sw nw 30-7n-12w	30	1934
Certain-Teed Product, Fee 10, sw se ne 33-7n-12w	60	1893
A. T. Wright, Bunker 2, nw nw se 5-6n-12w	30	1823
Ottawa County—		
Smith Pet. Co., Masterson 1, sw se se 23-7n-13w	100	1887
May 4, nw ne nw 25-7n-13w	240	1872
Basin Oil Co., Connel 4, sw sw se 24-7n-13w	600	1909
C. C. Goff, Klute 1, sw ne nw 24-7n-13w	*	1941
Twin Dr. Co., McKay B6, se sw nw 24-7n-13w	100	1920
American Dr. Co., Zokie 1, c w½ 24-7n-13w	50	1937
North American, Kobel 1, 25-7n-13w	30	1880
Century, Riordian 3, ne sw nw 25-7n-13w	60	1872

Mississippi

Jefferson Davis County (Wildcat)—		
Fred E. Courson et al, Bailey 1, 4-6n-18w	*	6012
Yazoo County (Tinsley Dome)—		
Union Prod. Co., Perry 3, 24-10n-3w	500	4650
Stevens 9, 1-10n-3w	1400	4739

Missouri

Jackson County—		
Dodson, Fee 1, c nw ne 17-47n-30w	*	500
Hulse et al, Wiston 1, csl ne nw se 22-49n-32w	*	510

Montana

Glacier County (Cut Bank Field)—		
Santa Rita O&G Co.'s Rasmusson 2, ne sw sw 32-33n-5w	204	2798
Toole County (Kevin-Sunburst Field)—		
Big West Oil Co., Dahlquist 16, csl nw ne 28-35n-3w	80	1926

New Mexico

Chaves County (Wildcat)—		
E. J. Fisher & Hill, Hill 1, ne nw sw 8-15s-25e	*	850
Eddy County—		
Gordon M. Cone et al, Guy 1, ne nw se 9-18s-29e	72	2519
Leo R. Manning et al, Paton-McClay 1, ne nw ne 21-18s-30e	24	3133
Eddy County (Wildcat)—		
Harvey-Sergent & Rutter, Kistler 1, sw sw sw 9-18s-30e	*	3202
Lea County (Eunice)—		
Ohio Oil Co., McDonald-State 14, ne nw nw 13-22s-36e	888	3800
The Texas Co., State-Lieu 20-H, c se nw 20-20s-37e	184	3835
Lea County (Lovington)—		
Skelly Oil Co., State 2-R, c se nw 36-16s-36e	100	5025
Lea County (Maljamar)—		
Barney Cockburn et al, Baish 6-B, c se nw 27-17s-32e	300	3905
Lea County (Mattix)—		
J. M. Rush et al, Mattix 1, c se nw 10-24s-37e	240	3568
The Texas Co., Fristoe 6, c nw nw 35-24s-37e	110	3518
Lea County (Penrose)—		
Gulf Oil Corp., Brunson 2, c sw ne 10-22s-37e	23	3727
N. G. Penrose et al, Mattix 6, swc 7-22s-37e	1704	3740

New York

Allegany County—		
Ebenezer Oil Co., Herrick farm, Alma	8	1343
B. & B. Oil Co., Moore farm, Bolivar	6	1382
Penn-York Oil Co., Welch farm, Bolivar	4	1460
D. F. Allen et al, Richardson farm, Bolivar	4	1186
M. J. Crowley, Coast et al farm, Bolivar	8	1284
Carl Oil Co., Robinson farm, Scio	5	1121
Porge Oil Co., Anderson farm, Alma	9	1276
F. E. Richart et al, Barrett farm, Alma	6	1580
L. E. Norton, Coats farm, Scio	6	1180
Summitt Oil Co., Doty farm, Scio	3	1167
Mack Oil Co., Mack farm, Bolivar	7	1265
Quaker Oil Co., Brown farm, Alma	3	1241
L. H. Thornton et al, Cornwell farm, Alma	5	1228
Cam Oil Corp., Colegrove farm, Genesee	6	1386
Karl-Weller Oil Corp., Karl farm, Genesee	7	1374
Empire Prod. Co., F. Cornelius farm, Willing (Oriskany sand)	¶9¾	4949
Water (Intake) Well Completions		
Liberty Share Corp., Lee farm, Bolivar	..	1372
R. B. Moore et al, Daggett farm, Bolivar	..	1282
Messer Pet. Corp., Wilson farm, Bolivar	..	1392
Bradley Prod. Corp., Monitor farm, Alma	..	1378
Mack Oil Co., Mack farm, Bolivar	..	1245
Quaker Oil Co., Brown farm, Alma	..	1229
A. C. Shaner Oil Co., Childs farm, Clarksville	..	1242
Steuben County—		
Belmont Quad. Dr. Co., Dean 1	*	927
Empire Prod. Co., Lynch 1	*	625
Hanley & Bird, Burger 1	*	4562

Ohio

Athens County—		
Ross, Wermer & Ross, Ackley 9	¶.02	1539
Knox County—		
Burch & Stattlmire, Cochran 1	10	545
Licking County—		
Ray Penick, Eshelman 3	¶1.50	2596
Medina County—		
Marine Trust Co., Ross A-19	5	398
Ross A-24	5	340
Ross A-15	5	375
Shaw A-5	5	327
Harmon Co., Monosmith 1	¶.23	2614
Muskingum County—		
Gas Producing Co. of Ohio, Boyce 2	¶.70	4275
Noble County—		
Lumbatis & Co., Booth 1	2	1810

Oklahoma

Caddo County—		
Magnolia, McKenna 14, ne se se 11-5n-9w	*	3433
Nichlos, Royce 4, ne se sw ne 12-5n-9w	¶1	3557
Phillips, Oaks 1, nec se 34-6n-10w	¶40.6	5263
Carter County—		
Jones Oil Co., Okla-Dillard 10, sw nw sw ne 22-4s-2w	*	1006
Comanche County—		
McKey, Truitt 5, nw ne sw se 26-2n-11w	25	192
Canadian County—		
Supreme Oil Co., Tilley 1, se nwc ne 20-12n-10w	*	400
Creek County—		
Cities Service, Walker 1, sw sw nw nw 32-14n-10e (otd 3446 ft)	12	2800
Dunn et al, Anthis 3, ne se se 34-14n-10e	75	3306
Chapman et al, Allen 3, sw se se 35-15n-10e	47	3139
Garvin County—		
Winkler, Ellis 1, nec 32-1n-3w	67	2348
Grady County—		
Magnolia, Harrison 9, c e½ se ne 28-3n-5w	105	2496
Jackson County—		
Gulf, Lizzy 1, sec nw 4-1n-20w	¶1.1	1612
Burnham, Guyerman "B" 1, sw ne sw 14-1n-20w (otd 1360 ft)	60	1522
Lincoln County—		
Yorkan, Stewart 1, sw ne nw 15-13n-6e	252	4276
Okfuskee County—		
Summit Dr. Co. et al, Thompson 1, se se sw nw 18-10n-11e	486	2310
Titus, Replogle 1-A, c e½ se ne 26-11n-8e	105	3501

*Failures; †Junked; ¶Million cu. ft. gas.

Enjoy 1940 Ease and Beauty In Braniff's New 21-Passenger Douglas Super-B-Liners

WITHOUT a peer in today's sky, these 1940 Douglas DC-3's bring *New* roominess and comfort to discriminating travelers between the Great Lakes and the Gulf.

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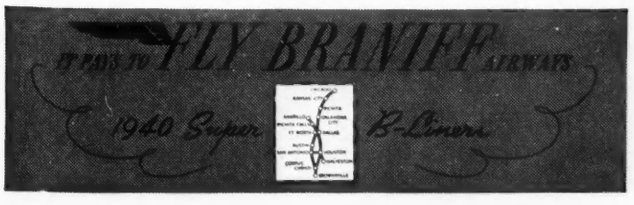
M-11



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GENUINE "VULCAN" TONGS: Every part built to bear its share of the load. Chains proof-tested and certified; Jaws and Handle are tough drop-forgings; Through-bolt is extra heavy, and its U. S. Standard Nut simplifies replacement. 8 sizes with Flat Link or Cable Chain—1/8" to 18" pipe.

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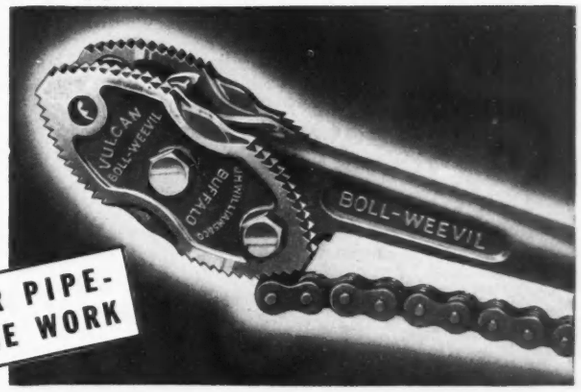

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J. H. WILLIAMS & CO., 225 Lafayette St., NEW YORK

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Oklahoma County—		
Phillips, Stiles 7, nw nwc ne 34-12n-3w	1060	6581
Payne County—		
Mid-Continent et al, Ramsey 13, cwl sw ne nw 18-18n-2e	5792	4755
Pontotoc County—		
Senora, Tucker 1, sw ne ne 35-5n-4e (otd 2532 ft)	250	2574
Delaney et al, Harrell 7, nw ne se 29-5n-8e	45	867
Pottawatomie County—		
H. Phillips, Bettis 1-B, sw sec sw 21-7n-4e	2483	4315
J. F. Smith, Hines 1-A, nw sw nw 22-7n-4e (otd 3185 ft)	35	3940
Gulf, Dodson 2, nw ne se 26-7n-4e (otd 4250 ft)	22	4291
Magnolia, Brister 4, 100 ft n swc ne 28-7n-4e	54	4324
Robinson et al, Johnson 2, nec sw 29-7n-5e (otd 4100 ft)	145	4165
Mid-Continent, Vieux 4, se nw se 31-7n-5e (otd 4150 ft)	100	4190
J. F. Smith, McDaniels 3, sw se ne 31-7n-5e	7	4013
Yorkan, Williams 1, nwc sw 4-10n-4e	*	58
Seminole County—		
Phillips, Tewee 2, sw ne se 14-7n-6e	22½	4208
Wagoner County—		
Hartman et al, Secrest 1, nw nw se ne 21-17n-16e	*	936

Pennsylvania

Bradford District—

Starr & Wingrove, Potter	½	....
Ryder Scott Co., fee	5	....
H. E. Camp Estate, Bing 263	2	....
D. W. Dale No. 2, Bing 368	1	....
Simpson Cooper Oil Co., Newton Smith	1	....
Pine Run Oil Co., Bing 130-1-2-3-4-6	3	....
Penn Valley Crude Oil Corp., fee	2	....
Duffytown Oil Co., Sullivan	½	....
Forest Oil Corp.	1	....
Forest Petroleum Corp., 2 wells	2	....
Niagara Oil Corp., 3 wells	3	....
Bradford Transit Co., 9 wells	9	....

Bradford District (Water Intake Wells)

Andrus & MacDowell, Bing 326	..	....
Pine Run Oil Co., Bing 130-1-2-3-4-6	..	....
Forest Oil Corp., 2 wells	..	....
Forest Petroleum Corp., 2 wells	..	....
Niagara Oil Corp., 6 wells	..	....

Middle District

Titusville Trust Co. & Fleming, Lot 3192	½	....
W. E. Fertig, Kerr	1	....

Middle District (Water Intake Wells)

Joseph Karl et al, Lot 106	..	....

Butler-Armstrong District

Peoples Natural Gas Co., F. Harkelroad	¶	....
Weber, Schaffner et al, Dugan	*	....

N. Y.-PENN GAS FIELD

Potter County—		
New Penn Dev. Co., Dunshie 1	*	4997
G. L. Cabot, Inc., Torak 1	¶.54	5238
Kidney 1	*	5285

SOUTHWEST PENNSYLVANIA

Butler County—		
Heck, Larkin et al, Jeuther 1	10	1820
Clarion County—		
Owens-Illinois Glass Co., Keck 2	¶.08	2562
Indiana County—		
Dr. Mohan et al, Nesbitt 1	*	1400

Texas Gulf Coast

Big Hill—		
Marrs McLean, Gulf-Tex Oil Co. 1	*	4443
Lovall Lake—		
Humble, Todd 4	216	7724
Hull—		
Gulf, Phoenix Dev. Co., 115	*	8166
Manvel—		
C. E. Olsen, Stone 1	*	7238
Texas Co., Houston Oil Field Association 34	469	5670
Markham—		
Red Bank, Smith 4	*	1344
South China—		
Titanic Oil Co., Guiterman B-1	170	7566
Pickett Ridge—		
Texas Co., Pierce Estate A-34	*	5000
Thompson—		
Humble, Davis 26	218	5410
Gulf, Wolters B-4	119	5413
Withers—		
Texas Co., Pierce Estate B-48	109	5548
Pierce Estate C-68	123	5385
Wharton County—		
J. F. Hutchins, Borden 2, Mackey area, E. M. Cox sur	5	4771

Texas Panhandle

Carson County—		
Magnolia, Fee (tract 244) 70	324	3095
Gray County—		
Magnolia, Haggard 16	278	3300
Sinclair Prairie, Pope 4	168	3312
Southwest Prod. Co., McKay 3	†260	2610
Hutchinson County—		
J. M. Huber Pet. Co., Johnson 1	81	3297
Skelly Oil Co., Watkins 9	413	2810
Whittington Est. et al, Merchant 1	¶24	2670

West Texas

Cochran County (Duggan)—		
Atlantic, Boyd-Humble 2	523	5050
Crane County (McCamey)—		
Quality Prod. Co., Howard-Texaco 3	3	2340
Crockett County (Todd)—		
Stanolind, Todd 5-A	34	1385
Crockett County (Wildcat)—		
Moore Bros. Corp., Henderson-Sinclair 1	*	850
Ector County (Foster)—		
Barnsdall, M. Witcher 2	1367	4170
Broderick & Calvert, Johnson 5-A	772	4283
Lee Drl. Co., Johnson 9	510	4301
Stanolind, E. F. Cowden 44-A	373	4170
J. E. Witcher 25	977	4225
J. E. Witcher 32	1154	4300
Ector County (Goldsmith)—		
Gulf, Goldsmith 244	3256	4185
Goldsmith 245	462	4204
Goldsmith 246	980	4198
Ector County (North Cowden)—		
Barnsdall, Smith 4	1104	4195
T. P. Coal & Oil Co., Holt 5	783	4527
Gaines County (Wasson)—		
Continental, Wasson 4-49	1209	4990
Hockley County (Slaughter)—		
J. W. Murchison et al, Slaughter 3	848	5012
Pecos County (Lehn)—		
Sahara Oil Corp., Sullivan 3-B	102	1682
Sullivan 9-B	130	1675
Sullivan 8-C	178	1692
Pecos County (Taylor-Link)—		
S. P. Williams et al, University-Conoco 2-A	*	1155
Scurry County (Sharon)—		
D. & R. Oil Co., McClure 4	353	2370
Magnolia, McClure 5	127	2465
F. W. Merrick, McClure 1	272	2492
McClure 2	171	2470
Upton County (McCamey)—		
T. P. Coal & Oil Co., Lane 43-A	304	2009
Ward County—		
E. S. Briant et al, Jones 5	272	2683
Mid-Continent, Sealy-Magnolia 3	546	3073
Ward County (Wildcat)—		
Magnolia, Geo. Sealy 2-43	¶61	3018
Winkler County (Emperor)—		
Duquesne & Hoffman-Page Co., Morton-Humble 1-B	23	2908
Yoakum County (Wasson)—		
Aloco Oil Co., J. E. Hill 3	546	5215
Anderson-Prichard, Willard 1-761	680	5203
Continental, Stevens 3-A	470	5100
Honolulu, Willard 2-761	1015	5190
Humble, H. O. Wooten 23	950	5135
Mabee O&G Co., Willard 17-741	1081	5212
Magnolia, Mahoney 7	1080	5180
Shell, Baumgart 5-B	1087	5192
Baumgart 5-D	1071	5159
W. S. Hodges 6	335	5231
T. P. Coal & Oil Co., Cecil-Bloomer 4-A	2285	5090

North Texas

Archer County (Hull-Silk)—		
Chapman & McFarlin, Wilson 7-C	664	4394
Ed Cox & Jake Hamon, Anderson 2	432	4416
Bert Ligon et al, Little 3-A	1016	4385
Petroleum Producers Co., Wilson-McCrory 3	1432	4359
Archer County—		
Guy J. Brown et al, Perkins 4, blk 21	10	1022
Bert Ligon et al, White 1-E, sec 40	44	1404
Shell Oil Co., Turbeville 2-A, blk 170	*	1535
Baylor County (Seymour)—		
British-American O. P. Co., Green 7-D	800	2569
Clay County—		
E. N. Costley et al, Taylor 6-D	*	1275
Duncan-Arnhold et al, Duncan 18, blk 14	168	1190
Cooke County—		
Bridwell Oil Co., Flusche 4-B	10	780
Kingery Bros. et al, J. Flusche 1	76	1006
Cooke County (Walnut Bend)—		
Ed. Cox & Hamon, Neu-Texaco 7-B	†	3736
Grayson County (Wildcat)—		
John Gray et al, Brown 1	*	285
Jack County—		
Champlin & Bass, Gahagan 3-A	432	3170
Harper & Knappenberger, Loving 1, sec 2753	*	3252
Jack County (Wildcat)—		
M. I. Whitsett et al, Hoefle 1	*	462
Throckmorton County—		
Falls Prod. Co., Graham 12, sec 992	*	1392
Wichita County (K-M-A)—		
C. O. Davis & W. Cain, Jones 1	912	4089
E. C. Oil Co., Burnside 5	560	4075
Mangold 22, blk 33	1072	3855
Fain-McGaha Oil Corp., Griffin 5-A	744	3853
J. C. Jennings Dr. Co., Burnett 1	408	4038
Mitchell Oil Co., Mitchell 2-B	400	3883
Wichita County—		
Fred M. Gates et al, Birk 1	4	457
Mogren & Anderson, Goetze 6, sec 2	*	530
Underwood Oil Co., Rogers 10	*	1285
Rogers 11	*	1481
Wichita County (Wildcat)—		
L. T. Burns et al, Rexford 1	*	1652
Young County—		
W. G. Horn et al, Gregg 7	12	736

East Texas

Joiner Area—		
Alex McCutchin et al, Jarvis 12-a (85.8-ac)	360	3741
Placid Oil Co., Hale 13-B (71.45-ac)	175	3688
Kilgore Area—		
Sinclair Prairie, King 60-B, Tr. 1 (337.6-ac)	2400	3551
M. M. Travis, Inc., Evans-Elder 2 (1.96-ac)	2500	3552
Longview Area—		
S. J. Felsenthal et al, Glenn 5 (28-ac)	720	3648
Omega Oil Co., Nicholson 5 (25-ac)	1500	3636
B. F. Phillips et al, McBride 1 (57.8-ac)	240	3652
John Thomas et al, McGrede 3 (5½-ac)	3000	3619

South Texas

Jackson County—		
Boyle, Mauritz & Bros. 1-C (Mauritz)	*	6010
Magnolia, West 44-A (West Vanderbilt)	925	5130
Porter, Hill 1 (WC), 3 mi sw Cordele Field	*	3707
Jim Wells County—		
Arkansas, Brand 1 (WC), 2 mi s of Wade City Field	*	5415
Bowles, Whatley 1-A (Ben Bolt)	650	5275
Bridwell, Beasley 5 (Ben Bolt)	700	5236
Hoffman 5-A (Ben Bolt)	550	5238
Myers & Simons, Garcia 2 (Magnolia City)	500	5720
Shell, Huebner 1 (East Alice)	*	5364
Karnes County—		
Echols, Newberry 1 (WC), 4 mi se of Green (Green Prospect)	*	3009
Nueces County—		
Pan American, Driscoll 2 (Clara Driscoll)	350	3818
Refugio County—		
Hewitt and Dougherty, Rooke B-7 (La Rosa)	900	6339
Morgan, Mitchell B-2 (Refugio)	125	6438
San Patricio County—		
Plymouth, Sparks 7 (East White Point)	500	5675
Texas Atlas, Cotton 1 (McCampbell)	450	7490
Victoria County—		
Barnsdall, Wheless 5 (Placedo)	350	4764
J. W. Sewell, Fox 1 (WC), (Victoria)	*	5250
Duval County—		
Adams & Lefevre, Warden and Drought 1 (WC), 2 mi nw of Charamousca field	*	1395
Alaska-Texas, Peters 1 (WC), 3 mi e of Lopez field	*	2939
Cox & Hamon and Gorman-Yoakam, Sophie Hoffman 1 (Tarancahuas)	290	2043
Sophie Hoffman 2 (Tarancahuas)	390	2060
Harvey & Henderson, Wright 1 (WC), ½ mi w of Pool (Seven Sisters)	*	2500
Hiawatha, Denman 6 (Longhorn)	350	5942
Magnolia, Duval County Ranch 2 (189), (Cedro Hill)	53	1465
Miller, Fee 19 (Longhorn)	92	4085
Navarro, Mew 5 (Fitzsimmons)	350	4252
Plymouth, Hoffman 2-C (Tarancahuas)	*	2846
Shell, Lopez 1 (WC), 7 mi nw of Benavides	*	5700
McMullen County—		
Gohlke, Miles Ranch 3 (WC), 9½ mi ne of Munson field	*	1002
Starr County—		
Humble, McGill 52 (Kelsey)	*	5114
Sun, Montalvo 3-A (Sun)	450	5008
Webb County—		
Arkansas, Adami B-4 (Adami)	39	999
Glenda, Adami 4 (Adami)	44	1006
Killam, Bruni 64 (South O'Hern)	¶2½ & 35	1880
Guadalupe County—		
Sun, Knoblock 15 (Darst Creek)	80	2575
Williamson County—		
Hawkins, Bechmeyer 1 (Byersville)	*	916

*Failures; †Junked; ¶Million cu. ft. gas.

WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORTS

Kern County — Francis O'Reilly's Edison-Seale 5-28, nwc 5-30-29, Edison area, rur.

ILLINOIS
FIRST REPORTS

Adams County — H. Schuster's Fee 1, nw ne sw 25-2n-6w, Houstin tnp, rig.

Bureau County—F. E. Webb's Abrahams 1, nw ne ne 24-18n-18e, Walnut tnp, lcn.

Clark County—H. R. Snavely's S. Freeman 1, ne se nw 4-8n-11w, Hutsonville tnp, rig.

Crawford County—Canadian Oil Co.'s J. H. Goff 1, e½ nw se 16-5n-12w, Honey Creek tnp, rig.

Edwards County—Wilson Drilling Co. et al's R. W. Curtis 1, e½ ne se 13-3s-10e, French Creek tnp, dr. Sutphin et al's Coad 1, ne sw sw 7-3s-11e, French Creek tnp, moving in material. Barnes et al's Johnson 1, ne ne ne 18-3s-11e, French Creek tnp, lcn. Kingwood Oil Co.'s Johnson 2, ne se ne 18-3s-11e, French Creek tnp, rig.

Fayette County—Greene's McDonald 1, nw ne nw 23-7n-1e, Sharon tnp, dk. Kingwood Oil Co.'s Sloane 1, e ne se ne 29-9n-2e, Bowling Green tnp, rig.

Gallatin County—Exchange Oil Co.'s Huesting 1, nw sw nw se 7-8s-9e, Ridgway tnp, lcn.

Hamilton County—Kingwood Oil Co.'s Wilson 1, sw nw se 6-6s-7e, Mayberry tnp, dr.

Jasper County—LaSalle Drilling Co.'s Berryhill 1, ne ne nw 9-6n-14w, Hill tnp, dr.

Lawrence County—W. L. Dorsey's E. Vandermark 1, ne sw nw 2-2n-12w, Dennison tnp, dr.

Marion County—Jones & Adams' Adams 1, ne se ne 7-3n-1e, Carrigan tnp, shut down.

Monroe County—Henry Kyatt's Jacobs 1, ne nw ne 25-4s-10w, Renault tnp, shut down 475 ft. Dorsey Oil Co.'s Rose 1, nw nw sw 15-1s-10w, Columbia tnp, shut down after spudding.

Shelby County—Seaboard & Wiggins' Miller 1, sw sw se 32-11n-2e, Tower Hill tnp, lcn.

Vermillion County—H. L. Leak's J. Cadle 1, ne se sw 6-21n-11w, South Ross tnp, rig.

Wabash County—Hullman et al's C. B. Brines 1, nw ne se 5-1n-13w, Lancaster tnp, lcn.

Whiteside County—J. F. Morse's Sheldon 1, sw nw se 11-19n-7e, Hahnaman tnp, lcn.

Williamson County—Blalock's Smothers 1, c n½ se ne 9-9s-2e, West Marion tnp, shut down 2562 ft. Carterville Oil & Gas Co.'s L. Cannon 1, nw se sw 1-10s-1e, Grassy tnp, lcn.

COMPLETIONS

Bond County—Bond Oil Co.'s Vogel 1, c e½ nw nw 21-6n-4w, Shoal Creek tnp, top Devonian 1822 ft, abnd 1874 ft.

Gallatin County—Angle & Angle's Duffey 1, ne nw nw 25-8s-9e, Ridgway tnp, top St. Louis 2981 ft, abnd 3007 ft.

Jasper County—Mammoth Producers & Refiners' Johnoff 1, c e½ ne se 24-5n-9e, Small Wood tnp, top McClosky 2923 ft, temp abnd 2923 ft.

Marion County—A. J. Deleno's Sherman 1, sw nw nw 13-2n-2e, Salem tnp, temp abnd at 895 ft in Pennsylvanian. Carter Oil Co.'s Mona Milton 1, se sw se 33-1n-2e, Raccoon tnp, top McClosky 2149 ft, abnd 2185 ft.

Massac County—Kohle et al's O. W. Harvick 1, sw sw nw 23-14s-3e, Logan tnp, temp abnd 3030 ft in Devonian lime.

Menard County—Wm. Johnson's T. Johnson 1, se nw ne 26-19n-5w, Irish Grove tnp, abnd 1063 ft in Burlington lime.

St. Clair County—L. A. Painter's H. C. Petrie 1, nw nw se 28-2s-6w, Fayetteville tnp, top Trenton 2507 ft, abnd 2576 ft.

Schuyler County—J. Mackler's S. Simpson 1, nw nw nw 35-3n-1w, Oakland tnp, top Maquoketa shale 808 ft, abnd 831 ft.

Shelby County—Max Pray et al's Russell Estate 1, nw ne nw 18-10n-6e, Big Spring tnp, top Bethel 2023 ft, abnd 2049 ft.

Wabash County—D. & H. Drilling Co.'s Trapp Bros. 1, se ne se 31-1n-12w, Friendsville tnp, top Cypress 2069 ft, abnd 2143 ft. Delta Drilling Co.'s Dr. Utter 1, se se ne 17-1s-12w, Mt. Carmel tnp, pumped 19 bbls oil from Weiler sand to open Mt. Carmel pool, td 2050 ft, plugged back from 2400 ft.

Wayne County—J. Russell's Thilmony 1, c sw ne sw 21-1s-6e, Berry tnp, top St. Louis 3382 ft, abnd 3487½ ft. A. J. Albright's Collins 1, nw nw se 24-1s-9e, Massillon tnp, abnd 2525 ft in Menard-Vienna lime. South State Development Co.'s Wm. Grugg 1, se sw nw 24-2s-8e, Grover tnp, abnd at 3434 ft in McClosky.

White County—Bishop, Harrington, Bush et al's G. Griffin 1, se se sw 28-3s-9e, Burnt Prairie tnp, top McClosky 3445 ft, pumped 103 bbls oil to open Burnt Prairie field. R. W. Stemaker's Hannah 1, sw nw ne 31-5s-10e, Hawthorne tnp, top St. Louis 3162 ft, abnd 3195 ft.

KANSAS
FIRST REPORTS

Cowley County—C. F. Meyers' Dunn Estate 1, nwc 33-34-5e, plts.

Marion County—H. H. Royer's Kroch 1, nec nw 28-18-4e, dr.

Rooks County—Seaney et al's Morrison 1, csl sw ne 32-10-17w, lcn.

COMPLETIONS

Cowley County—Jock Garden et al's Rahn 1, swc nw 13-34-5e, 1 mi s Vinton, Rahn pool discovery, top Bartlesville 2910 ft, td 3435 ft, pb 2950 ft, shot 40 quarts, 1035 bbls, 40 gr.

Marion County—Troxwell et al's Bezdek 1, ne sw sw 32-17-4e, 3 mi sw Lost Springs pool, top Mississippi 2395 ft, abnd 2501 ft.

SOUTH LOUISIANA
FIRST REPORTS

Acadia Parish—Humble's Meche Leger 1, Branch area, 466 ft n of s line and 466 ft e of w line of 112-ac tract, sec 83-8s-2e, roads.

Jefferson Davis Parish—H. M. Naylor's Acadia Development Co. 1, Mermentau area, s 62 degrees 15 minutes e 3842 ft from wc of sec 40-10s-3w, thence n 27 degrees 45 minutes e 3480 ft in sec 12-10s-2w, roads.

Livingston Parish — Roberick & Tower's Pirie 1, Denham Springs area, 1329 ft sw along se line of sec 41 fr ec and 330 ft nw at right angles in sec 41-7s-3e, lcn.

MISSOURI
COMPLETIONS

Jackson County—B. Dodson's Fee 1, c nw ne 17-47n-30w, 2 mi w Shawhan gas pool, top Squirrel 335 ft, top Burbank 472 ft, td

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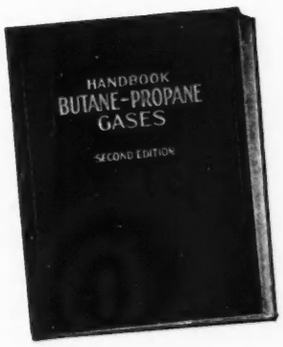

Butane-Propane Gases

SECOND EDITION—(Revised, September, 1938)

Feature Contents of this Complete Reference Work

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500 ft, abnd. Hulse et al's Wiston 1, csl ne nw se 22-49n-32w, 2 mi se Blue Ridge gas pool, top Squirrel 470 ft, shot 20 qts, 470-95 ft, td 510 ft, abnd.

MICHIGAN

FIRST REPORTS

Barry County—Sun Oil Co.'s Osborn 1, nw nw nw 11-3n-9w, rig.

Clare County—Sun Oil Co.'s State-Franklin A1, c s sw sw 4-20n-3w, rig.

Eaton County — Strange Oil & Gas Co.'s Garms 1, ne ne nw 4-1n-6w, rig.

Kalamazoo County—Bliss Keeler's Hosner 1, ne sw 13-1s-11w, dr.

Midland County—Associated and McClanahan's Lundstrom 1, sw nw 19-15n-2w, dr.

Ottawa County — Crow Development Co.'s Reimold 1, sw nw ne 34-5n-15w, rig.

COMPLETIONS

Allegan County — Norton & McRee's McKennon 1, ne nw 32-3n-12w, Traverse lime 1607 ft, so 1610 ft, abnd 1659 ft.

Gladwin County — Wicklund Development Co.'s State A1, sw sw se 11-18n-1w, owdd from 3645 ft; Salina salt base 4550 ft, so 4614 ft, water 4650 ft, abnd 4696 ft.

Kent County—Seaboard Oil Co.'s Martin 1, ne ne sw 17-5n-10w, Traverse 1934 ft, Dundee 2225 ft, Monroe 2269 ft, so 2290 ft, abnd 2301 ft.

NEW MEXICO

FIRST REPORTS

Luna County—O. D. Berry et al's Berry 2, 200 ft from s and 2316 ft from w lines 33-22s-10w, lcn.

COMPLETIONS

Chaves County—E. J. Fisher & Hill's Hill 1, ne nw sw 8-15s-25e, elev 3568 ft.

Eddy County—Harvey-Sergent & Rutter's Kistler 1, swc 9-18s-30e, elev 3516 ft, td 3202 ft, pb to 2982 ft for 230-quart nitro shot 2945-75 ft, recovered 25 bailers oil with 1900 ft water in hole and abnd.

OKLAHOMA

FIRST REPORTS

Choctaw County—Scott et al's Campbell 1, se sw ne 28-7s-15e, sd 50 ft.

Creek County—Zephyr Drlg. Co. et al's Brown 1, ne se se 19-16n-10e, dr.

Hughes County—Miller et al's Cahill 1, c e½ ne sw 2-6n-8e, dr.

Logan County—Helmerich & Payne's Kramer 1, nwc sw 24-17n-1e, rur.

COMPLETIONS

Creek County—Waite Drlg. Co.'s Garrett 1, nec 25-14n-10e, 1½ mi s Edna pool, top Wilcox 3160 ft, abnd 3188 ft.

Osage County—W. M. McKnab's Osage 1, nw ne sw 15-29n-8e, 5 mi e Elgin pool abnd 2600 ft.

WEST TEXAS

COMPLETIONS

Crockett County—Moore Bros. Corp.'s Henderson-Sinclair 1, sw ne nw GC&SF sec 51, blk OP, abnd 850 ft.

Ward County — Magnolia Pet. Co.'s Geo. Sealy 2-43, sw ne ne GMMB&A sec 43, blk F, elev 2670 ft, top brown lime 2510 ft, top Yates 2625 ft, top lime pay 2935 ft, td 3018 ft, pb to 2953 ft, gun-perforated casing, 61,000,000 ft gas with spray oil initial.

WEST CENTRAL TEXAS

FIRST REPORTS

Erath County—T. U. Gray et al's C. Young 1, 330 ft from se and 730 ft from sw lines of 476-acre lease, S. Smith sur, lcn.

Jones County—Humble O&R Co.'s Ed. Clift 1, 2333 ft from n and 2434 ft from e lines of A. Crain sur No. 214, A-152, rur for 3500-ft test.

SOUTH TEXAS

FIRST REPORTS

Bexar County—C. A. Smith's Evans 1, 165 ft s line, 1300 ft e line of 80-acre lease, sur No. 29, lcn. C. A. Smith's M. Sherrer 2, 1200 ft n line, 165 ft e line of 228-acre tract out of Surveys 21 and 22, lcn.

Gonzales County—M. T. Huebner's Tilda Dubose 1, 160 ft se line, 160 ft sw line 652-acre tract, E. G. Koffman sur, nw of Hockheim, lcn. M. T. Huebner's M. P. Smith 1, 175 ft ne line, 475 ft nw line of R. Plummer sur, 11 mi s of Gonzales, dr 975 ft.

Guadalupe County — Diamond Half Oil Corp.'s T. P. McKinney 1, 150 ft nw line, 132 ft n line, James Hinds sur, lcn. Diamond Half Oil Corp.'s J. Schackel 1, 150 ft from sw line, 150 ft from se line, F. Fuqua sur, lcn.

La Salle County—H. R. Cullen et al's J. L. Washburn 1, L. A. Earnest Sur No. 88, 8 mi sw of sw of Fowlerton, lcn.

Live Oak County—Hagan & Stewart's Susie E. Reagan 1, 700 ft s of Frio River, 650 ft e of county line and in Michael Hely sur, 2 mi ne of Calliham, lcn.

Nueces County—Houser, Warren & Ginther's Lynn Davis 1, 660 ft from s line, 330 ft from e line of s½ of nw¼ of sec 159, F. C. Bishop subdivision of Weil ranch, 3 mi w of Bishop, moving in.

COMPLETIONS

Duval County—Adams & Lefevre's Warden & Drought 1, 2 mi nw of Charamousca field, abnd 1395 ft. Alaska-Texas Oil Company et al's Peters 1, 3 mi e of Lopez field, abnd 2939 ft. Harvey & Henderson's Wright 1, ½ mi w of pool, Seven Sisters area, abnd 2500 ft. Shell Oil Company's Lopez 1, 7 mi nw of Benavides, abnd 5700 ft.

Jackson County—H. J. Porter's Hill 1, 3 mi sw of Cordelé field, abnd 3707 ft.

Jim Wells County—Arkansas Fuel Oil Co.'s Brand 1, 2 mi s of Wade City field, abnd 5415 ft.

Karnes County—Clyde Echols et al's Newberry 1, 4 mi se of Green, Green Prospect area, abnd 3009 ft.

McMullen County — F. H. Gohlke's Miles Ranch 3, 9½ mi ne of Munson field, dry and abnd at 1002 ft.

Victoria County—J. W. Sewell's Fox 1, Victoria area, in Victoria Town grant, abnd 5250 ft, tested salt water. George E. Smith et al's Stubbs Estate 1, 2 mi sw of Victoria field, drill stem test 4760-75 ft recovered 1980 ft salt water, no pressure, 38 minutes, ¼ and ⅝ inch chokes, abnd 4813 ft.

Webb County—O. W. Killam's Bruni 64, 2 mi s of O'Hern field, South O'Hern area, sprayed 35 barrels 22-gravity oil and 2,500,000 cubic feet gas through ⅝-inch choke under 300 pounds working pressure. Perforated 1802-06 feet with 12 shots.

NORTH TEXAS

FIRST REPORTS

Archer County—C. W. Clark et al's D. D. Strange 1, 150 ft out of sec sec 31, blk 5, Clark-Plumb sur, lcn. E. F. Scott et al's B. H. York 1, 150 ft out of sec w½ sec 1861, TE&L sur, lcn. Snoddy and Peery's Webb Bros. 1, 1100 ft from n and 1225 ft from w lines sec 1897, TE&L sur, lcn.

Clay County—L. T. Burns et al's W. R. Lyon 1, 150 ft out of sec n½ blk 89, Byers subdiv, 1 mi n Petrolia, lcn.

Cooke County—Seitz-Comegys & Seitz, Inc.'s John Luke 1, 1236 ft from n and 225 ft from e lines of 105-ac tr, E. Reed sur A-849, mim for 1400-ft test.

Foard County—Ohio Oil Co.'s M. E. Rasberry 1, c sw ne S. P. Ry. sec 26, 9 miles w by n of Crowell, lcn for 5000-ft test.

Jack County—Hilard R. Smith et al's Yates-Brant 1, 1180 ft out of sec of J. Holderman sur, 3½ mi n and 3 mi w of Jacksboro, lcn for 3500-ft test.

COMPLETIONS

Grayson County—John Gray et al's Geo. Brown 1, 150 ft out of nwc of J. W. Dogin sur A-377, abnd 285 ft.

Jack County—M. L. Whitsett et al's Hoefle 1, 600 ft from s and 300 ft from e lines of m/e/sec of J. W. Barrett sur A-48, abnd 462 ft.

Wichita County—L. T. Burns et al's Burch Rexford 1, 150 ft from n and 1350 ft from w lines of south 100 acres of west 200 acres of north 400 acres of C. T. Ry. sur A-395, abnd 1652 ft.

TEXAS GULF COAST

FIRST REPORTS

Brazoria County—McDannald's Hatfield 1, Pearland area, 15-ac tract, R. B. Lyle sur, lcn.

Matagorda County — Stanolind-Amerada's General American 1, Wadsworth area, center of lot 12, block 8 of subdivision, J. C. Peyton sur, lcn.

COMPLETION

Wharton County—J. F. Hutchin's Borden 2, Mackey area, E. M. Cox League, 3818 ft out of the nwc along the nw line, thence 466 ft at right angles on a 160-ac tract, perf 4758 to 4771 ft, made 4.5 bbls distillate daily, gas/oil ratio 145,000 to 1.

Provide 10-acre spacing for Tarancahuas, Duval County

Ten-acre spacing for wells in the Tarancahuas field, Duval County, is provided in an order issued by the Texas Railroad Commission last week. The rules call for a maximum gas-oil ratio allowance of 2000/1, but include no proration plan.

WELL LOGS. Drillers' logs of approximately 4,000 wells drilled in New Mexico are available from Well Log Division, New Mexico Bureau of Mines & Mineral Resources, Socorro, New Mexico. Write for price list A.

NOTES FOR THE Equipment Buyer and User

Gauge Cock

MERCO NORDSTROM VALVE COMPANY

To provide a leakproof gauge cock that can be completely opened or closed with a ¼-turn, Merco Nordstrom Valve Company, 400 Lexington Avenue, Pittsburgh, Pennsylvania, have developed a lubricated type for test pressures to 4000 pounds. The cock has a rated working pressure for water, oil and gas of 2000 pounds. Its body is forged steel and it has a stainless steel plug. Stick lubricant is inserted under a lubricant screw which can be turned down. Turning of the screw transmits hydraulic pressure to the seat, and in the event the cock becomes hard to turn, the pressure exerted will loosen it. Special lubricants are available for steam. It is made in ¼-inch and ⅜-inch sizes and is wrench-operated.

Merco Nordstrom Gauge Cock.

Two-Cylinder Engine

HERCULES MOTORS CORPORATION

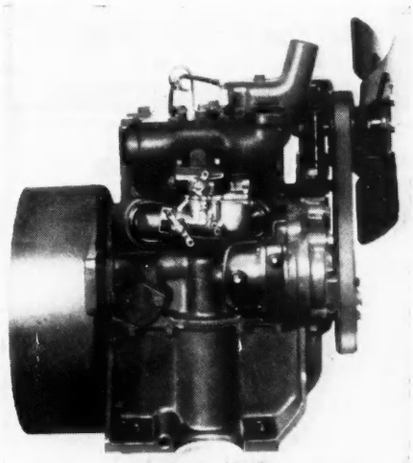
Hercules Motors Corporation, Canton, Ohio, has added a smaller two-cylinder, heavy-duty gasoline engine and power unit to its line of two-, four- and six-cylinder gasoline and Diesel engines. Internal dimensions of the new engine, designated Model BXB, are 2⅞-inch bore, 3-inch stroke and 39 cubic inch displacement. Maximum torque is 28 pounds feet at 1200 r.p.m. For continuous peak load service, the engine can be operated up to 1800 r.p.m. where it develops 9.2 corrected horsepower.

Although thermo-syphon cooling is standard practice on these engines, water circulating pumps are available. Updraft manifolds of either the center or rear-up outlet type can be furnished. Number 6 SAE bellhousing is furnished as standard equipment on the engines and the industrial power units, although the number 5 size can be furnished upon request.

Full force lubrication to all main and connecting rod bearings is furnished. The lubricating pump is located in the oil sump and is driven by helical gears from the main camshaft. Oil pressure can be easily adjusted to suit operating requirements. The crankcase is cast integral with the cylinder block, and carries the crankshaft support and two main bearings of ample proportion.

These engines have L-head cylinders and the valves have 30° seats. The crankshaft in the BXB is counterbalanced to compensate for the full amount of the rotating mass, plus 45 percent of the reciprocating mass, making for exceptionally smooth two-cylinder operation. Provision is made for the usual accessories, including generator, starter, flange mounted magneto, battery type distributor, mechanical governor, fuel pump, fan drive and carburetor.

A large number of the parts used in the BXB two-cylinder engine are interchangeable with the same parts in the company's ZX series four-cylinder engines.



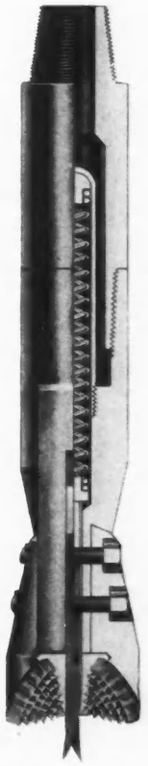
Hercules Engine

Combination Bit

MERRITT-WAXLER TOOL COMPANY

A combination bit, literally permitting a change of bits without coming out of the hole has been announced by Merritt-Waxler Tool Company, Kilgore, Texas. The bit is designed so that when hard formations are encountered, the soft formation bit automatically recedes into the body of the bit assembly and allows the cutting prongs to come into play. When the hard formation is passed, the soft formation bit comes back into play. Action is entirely automatic.

The blades are made of high-grade steel, completely heat treated from top to bottom. All cutting edges are studded with tungsten inserts and dressed to gauge with tungsten. The reaming action of the fish-tail blade makes it possible to set casing without trouble, it is claimed. The bit is provided in all standard sizes.

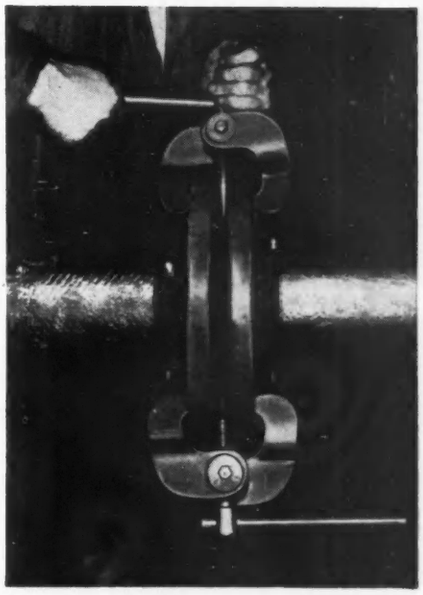


Combination Bit.

Flange-Jacks

THE GARLOCK PACKING COMPANY

A new tool for replacing gaskets in flanged pipe lines has been introduced by The Garlock Packing Company, Palmyra, New York, under the name Flange-Jack.



Garlock Flange-Jack

In operation, two bolts are removed from the flanges on opposite sides from each other. The jaws of a jack are placed in each of the bolt holes and tightened just enough to hold the jacks in position. The remainder of the bolts are then removed from the joint and the jackscrews tightened until sufficient opening between the flanges has been obtained. The old gasket is then removed, faces of the flanges cleaned and the new gaskets inserted. Both jackscrews are backed off simultaneously and the bolts applied to the flanges.

Arc Welding Set

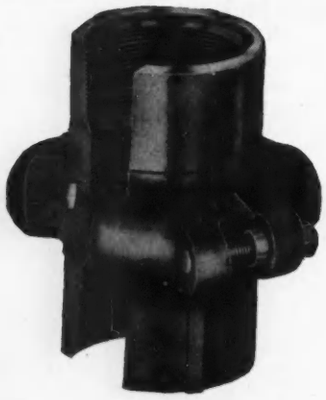
GENERAL ELECTRIC COMPANY

General Electric Company, Schenectady, New York, has redesigned its 1500-ampere constant potential arc welding sets for multiple-operator and machine welding into a more compact unit of lighter weight which provides greater convenience of installation. The unit now has control for motor and generator mounted on a base for more convenient operation.

Where a number of operators are supplied from one set, advantage can be taken of the fact that average hand welding is not continuous. This diversity allows the use of smaller capacity in supplying a given connected load.

The sets are equipped with standard driving motors for operation on direct current or on a polyphase alternating current at any commercial voltage. Synchronous driving motors may be used.

Red-Rex
QUICK-JOINT
PIPE UNIONS



Red-Rex Malleable Unions are designed for 500 lbs. working pressure and tested to 1,000 lbs. Made in both "short hub" and "long hub" types. Identical in construction throughout with high pressure steel union. Interchangeable seal rings.

Completely Described in 1940 Composite Catalog. See Pages 1808-1809.

OIL CITY BRASS WORKS
FOUNDERS · MANUFACTURERS · MACHINISTS
BEAUMONT, TEXAS—U.S.A.
Export Office:
19 Rector St. New York City, U.S.A.
Sold Through Supply Stores

For QUICK, ACCURATE TESTS
Use CURTIN CENTRIFUGES

No. 3420...15 c.c. machine. Cranks and heads interchangeable with 100 c.c. machines.

Simple in design . . . Ruggedly built . . . Require no special care . . . Gear Ratio and throw of crank produce required speed with no strain. Curtin Centrifuges meet all **A.S.T.M. STANDARD METHOD D-96-35** and **A.P.I. CODE NO. 25** requirements. Full descriptive literature upon request.

W·H·CURTIN & CO. Inc.
HOUSTON U·S·A TEXAS

NOTES FOR THE Equipment Buyer and User

Timken Roller Bearing Company Names Kuhl to Industrial Division

The Timken Roller Bearing Company has appointed M. H. Kuhl assistant manager of its Industrial Division. The position was formerly held by S. D. Partridge, who was made manager of the division a few weeks ago. Kuhl, a graduate of the University of Illinois, joined the company in 1926, and has been active in the Industrial Division since that time as sales engineer and district manager.

P. J. Reeves, Carnegie Institute of Technology graduate and 11 years with The Timken Company, has been transferred to the home office to engage in special sales work. His former position as manager of the Los Angeles office is being filled by S. T. Salvage, promoted from the company's sales-engineering ranks. Salvage is a graduate of Stetson University and has been with the company 7 years.

H. R. MacMillan Elected International Nickel Director

H. R. MacMillan, prominent Canadian industrialist of Vancouver, British Columbia, has been elected a director of The International Nickel Company of Canada, Limited, according to Robert C. Stanley, chairman and president. He succeeds the late James A. Richardson, Winnipeg, Manitoba, and his election provides the board with representation from Western Canada.

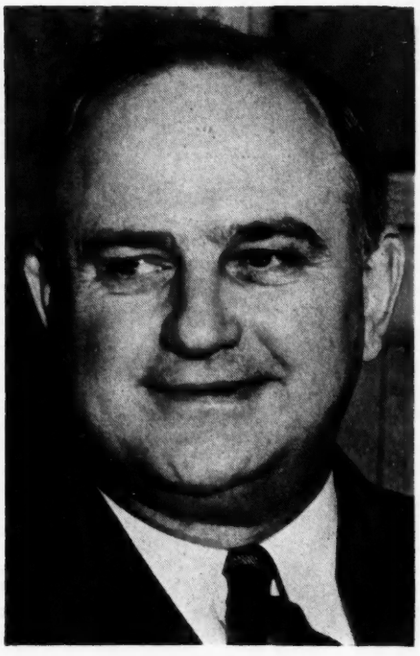
Mr. MacMillan is well known in Canada in governmental, financial, commercial and industrial circles. He is president of H. R. MacMillan Export Company, Limited, as well as British Columbia Packers, Limited, and Australian British Columbia Shipping Company.

Stanley also announced that Robert L. Beattie was elected an assistant vice president and will remain at the company's general offices in Copper Cliff, Ontario. Since 1935 he has been general assistant to the general manager. He started with the company in November, 1911, working for the accounting department at the Copper Cliff warehouse. From 1918 to 1921, he was in the accounting department at the company's Toronto office. He later became assistant works auditor at Copper Cliff, and in 1933 was made works auditor.

Binder Named to New Allis-Chalmers Post

H. P. Binder has been appointed assistant manager of the Centrifugal Pump Division of the Allis-Chalmers Manufacturing Company, it has been announced by Dr. William M. White, manager and chief engineer of the company's Hydraulic Department.

A graduate of the School of Electrical Engineering of Purdue University, Binder was selected to enter the company's Graduate Training Course in 1911. In 1912, he entered the Hydraulic Engineering Department where he served until 1917, at which time he joined the 9th Field Artillery of the regular army. At the conclusion of the war, he resigned with the rank of captain and returned to the Allis-Chalmers Company. In the company's Centrifugal Pump Division, he took up sales-engineering work that required him to visit various district offices to assist salesmen on local problems.



H. P. BINDER

Standco
NO-SMOKE
STANDCO BRAKE LINING
Is the driller's best friend because it makes the easiest brake known and "feeds off" evenly while drilling. It never scores brake rims. See Page 2100 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

STOPPERS FOR OIL LINES

Send for catalogue
SAFETY GAS MAIN STOPPER CO.
523 Atlantic Ave. Brooklyn, N. Y.

NOTES FOR THE Equipment Buyer and User

Engineering Laboratories Name John C. Carroll Sales Manager

John C. Carroll has been named sales manager of Engineering Laboratories, Inc., Tulsa. His experience includes several years' with a major oil company and five years as chief flight instructor in an aviation school. He will make his headquarters at Tulsa.

Lane-Wells Transfers Bowsky from Los Angeles to Houston

Announcement is made by Norman L. Dorn, vice president of Lane-Wells Company, of transfer of Merle C. Bowsky from the Los Angeles to Houston office. Most of Bowsky's work during the past year has been in connection with the development of the Electrolog method of electrical open hole logging. It is understood that he will supervise the engineering work on Electrologging in the Gulf Coast.

Dorn also announced the starting of new field construction work at New Iberia, Louisiana. Offices, warehouse, etc., are being erected at a reported cost in the neighborhood of $10,000.

Iverson Tool Opens Store at Artesia

Iverson Tool Company, Tulsa, has recently opened a supply store at Artesia, New Mexico. Earl Seigler is manager. Active developments in Eddy County necessitated expansion of the company's facilities.

Buckeye Traction Ditcher Company Acquires Emsco Patents

Recent acquisition of all Emsco tractor equipment patents along with all patents under which Emsco was licensed or had working agreements and all Emsco applications for patents by the Buckeye Traction Ditcher Company, Findlay, Ohio, has been announced by William H. Schomburg, executive vice president of the company.

This tractor equipment is being manufactured at Findlay, Ohio, and sales are also from the company's general office in Findlay.

A new ditcher, described as the smallest on the market and designated Model 410, was recently announced by

JOHN C. CARROLL

the company. Chain and bucket type, it was designed to get in close quarters for small ditching work.

Buckeye Traction Ditcher Company maintains an export office at 80 Broad Street, New York.

Merco Centrifugal Company Names New Distributor

Appointment of Oilwell Chemical & Materials Company, Inc., Bakersfield, California, as sole distributors for the

EDWARD SAM SELF
President, Oilwell Chemical & Materials Company

Elastic Stop SELF-LOCKING NUTS

THE nuts with the resilient non-metallic locking collar ...many types...all sizes ...all thread systems... any material.

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ELASTIC STOP NUT CORPORATION
1001G Newark Ave. • Elizabeth, New Jersey

CASING HEADS of Forged Steel

There is a Brewster Head for every casing or collar size and any pressure up to 10,000 pounds. Many are provided with a special feature that permits re-packing under pressure. All studs are heat-treated. Let us have your requirements and we will gladly quote prices and send you a catalog.

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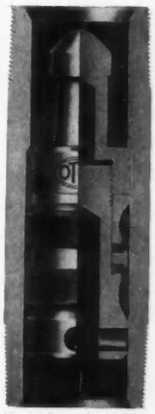
THE OTIS TUBING ● CLOSING TOOL—Type G SEALS AND RESEALS



U. S. Pat. 2180605, 1898261, 1984230

After the Otis Tubing Closing Tool, Type G, is used to seal the tubing for running under pressure in high pressure, low pressure or heading wells, the plunger is dropped to a bull plug below tubing perforations and cannot be reseated by flow. In order to reseal the tubing to change surface connections, pull pipe, etc., the plunger is picked up by an Otis Releasing Pulling Tool and reseated in its landing nipple.

WRITE OTIS TODAY
PRESSURE CONTROL
INCORPORATED
DALLAS, TEXAS

new Merco Type A-24 Concentrator and the Merco Type A-24 Desander has been announced by Clarence J. Brown, vice president of Merco Centrifugal Company, San Francisco.

Sales and engineering staff of the distributorship are under the direction of Edward Sam Self, president. A complete testing laboratory and field testing facilities are maintained to render practical service to drilling operators everywhere in California.

Intermitter

The S. M. Jones Company, Tulsa, has issued a folder on its new Jones-Staggs Intermitter that graphically pictures operation of the gas-lift device and illustrates its use under various conditions.

B. E. Johnston to Represent U. S. Firms in South America

B. E. "Buddy" Johnston, who has been in the United States on business for several weeks, reports that he is returning to South America to represent E. M. Smith Company of Los Angeles, California; Globe Oil Tools Company of Los Nietos, California; and The MacClatchie Company of Compton, California.

As direct factory representative for these companies, he will cover all the active oil fields of Trinidad, Venezuela and Colombia at regular intervals, providing direct contact between the manufacturers and users of their products.

Johnston has been located in South America during the past 12 years, and is familiar with all the South American oil fields.

B. E. JOHNSTON

Osage Metal Company Victor in Patent Suit

Court action brought by the Haynes Stellite Company against the Osage Metal Company, Inc., of Oklahoma City, for alleged infringement of both process and apparatus patents, is invalid, according to a decision of United States Circuit Court of Appeals affirming Judge Murrah's decision in United States District Court for Western District of Oklahoma.

Haynes Stellite Company claimed that Osage Metal Company, Inc., infringed on Claim 2 of patent No. 1,824,976, issued August 29, 1933, covering an apparatus for fusing and casting alloys of high melting temperatures; and Claims 1, 2 and 4 of patent No. 1,962,705, issued June 12, 1934, covering a process for fusing and casting such alloys.

McAdams Guiberson Corporation Representative at New Iberia

R. L. McAdams, formerly at the Guiberson Corporation's warehouse at Kilgore, Texas, has been transferred to South Louisiana where he will be field representative for Guiberson flow valves and other oil field tools. He has made his headquarters at New Iberia.

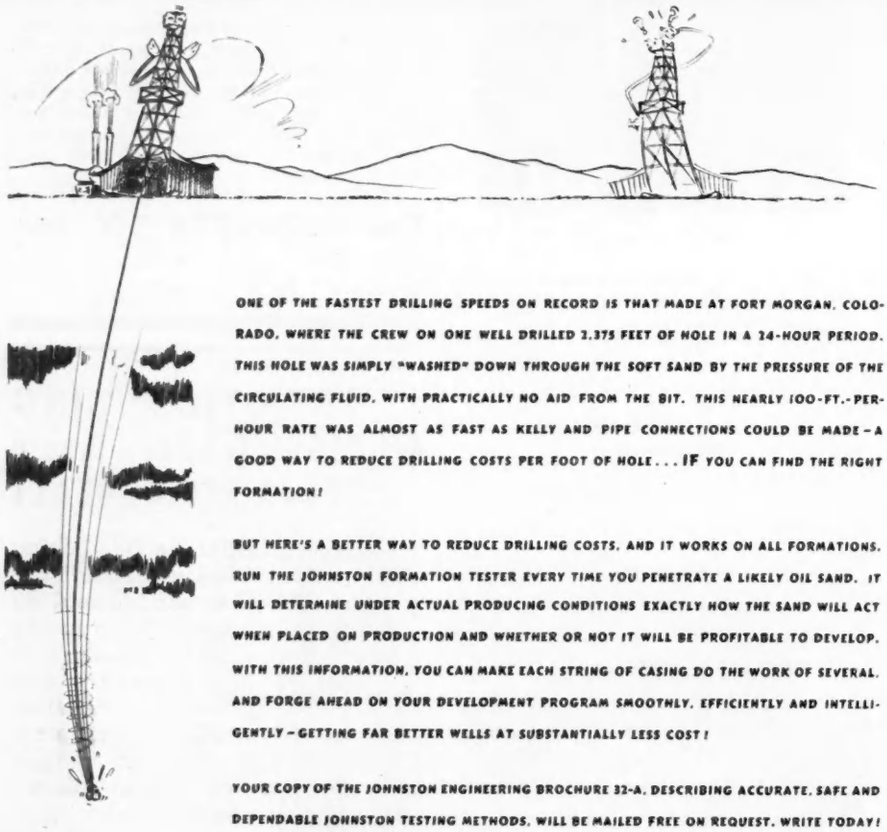
Prior to his connection with The Guiberson Corporation, McAdams was employed by Gas Lift Sales Company as flow valve sales engineer in East Texas.

Valve Selection

Jenkins Bros., 80 White Street, New York, has issued a book on valve selection, captioned "Jenkins Recommends," designed to eliminate the guesswork in specifying valves for use in connection with boilers, engines, turbines, diesels, pumps, heaters and related equipment.

One diagram is devoted to each unit of equipment and connecting lines indicate accepted practice for installing valves. An identifying letter on each valve refers to a chart where the exact pattern, construction and metal to meet individual requirements can be found.

It's a Fact — Johnston



ONE OF THE FASTEST DRILLING SPEEDS ON RECORD IS THAT MADE AT FORT MORGAN, COLORADO, WHERE THE CREW ON ONE WELL DRILLED 2,375 FEET OF HOLE IN A 24-HOUR PERIOD. THIS HOLE WAS SIMPLY "WASHED" DOWN THROUGH THE SOFT SAND BY THE PRESSURE OF THE CIRCULATING FLUID, WITH PRACTICALLY NO AID FROM THE BIT. THIS NEARLY 100-FT.-PER-HOUR RATE WAS ALMOST AS FAST AS KELLY AND PIPE CONNECTIONS COULD BE MADE—A GOOD WAY TO REDUCE DRILLING COSTS PER FOOT OF HOLE . . . IF YOU CAN FIND THE RIGHT FORMATION!

BUT HERE'S A BETTER WAY TO REDUCE DRILLING COSTS, AND IT WORKS ON ALL FORMATIONS. RUN THE JOHNSTON FORMATION TESTER EVERY TIME YOU PENETRATE A LIKELY OIL SAND. IT WILL DETERMINE UNDER ACTUAL PRODUCING CONDITIONS EXACTLY HOW THE SAND WILL ACT WHEN PLACED ON PRODUCTION AND WHETHER OR NOT IT WILL BE PROFITABLE TO DEVELOP. WITH THIS INFORMATION, YOU CAN MAKE EACH STRING OF CASING DO THE WORK OF SEVERAL. AND FORGE AHEAD ON YOUR DEVELOPMENT PROGRAM SMOOTHLY, EFFICIENTLY AND INTELLIGENTLY—GETTING FAR BETTER WELLS AT SUBSTANTIALLY LESS COST!

YOUR COPY OF THE JOHNSTON ENGINEERING BROCHURE 32-A, DESCRIBING ACCURATE, SAFE AND DEPENDABLE JOHNSTON TESTING METHODS, WILL BE MAILED FREE ON REQUEST. WRITE TODAY!

Johnston

$5.00 FIVE DOLLARS ($5.00) WILL BE PAID FOR EACH INTERESTING OR UNUSUAL FACT CONCERNING THE PETROLEUM INDUSTRY (EITHER IN THE UNITED STATES OR ABROAD) WHICH IS USED IN THIS SERIES OF JOHNSTON ADVERTISEMENTS. SUBSTANTIAL PROOF MUST ACCOMPANY EACH CONTRIBUTION. WHEN TWO OR MORE SIMILAR FACTS ARE SENT IN, THE AWARD WILL BE GIVEN TO THE FIRST ONE RECEIVED . . .

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"Servicing California and Selling Exclusively Foreign"

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5702 NAVIGATION BLVD.
HOUSTON, TEXAS
"Servicing Mid-Continent and Gulf Coast"

"WHY SET CASING BEFORE YOU KNOW!"

Squeaks from the Bull Wheel

Unfounded Rumor

"I heard that Mabel has a propensity for petting."

"Aw, all she's got is just an old-fashioned sofa like ours."

Uncouth Fellow

"Did that course in English help your boy friend any?"

"No, he still ends every sentence with a proposition."

Old Sweet Song

"If a man says 'I will paddle my own canoe,' he doesn't really mean that he has a canoe or that he is to paddle it. He just means that he will carry on without help.

"Now, can anyone give me another example of a phrase that means something different from what it says?"

"Yes, miss, 'I have been detained late at the office, dear'."

His Definition

"Tommy, what do we mean by nutritious food?"

"Aw it's something to eat that's filling but ain't got no taste to it."

Too Far

"Ellen was arrested because her balloon dance was too daring."

"You mean she went beyond herself?"

"No, just beyond her balloon."

Experienced

The sweet young thing asked me if I could tell her how to play golf.

"Sure, it's easy enough," I told her. "All you do is smack the pill and then walk."

"How interesting," she replied, "just like some auto rides I've been on."

Good Night

The patter of tiny feet was heard from the head of the stairs. The proud mother raised her hand, warning the members of her bridge club to be silent.

"Hush," she said softly, "the children are going to deliver their good-night message. It always gives me a feeling of reverence to hear them. Listen!"

"Mama," came the message in a shrill whisper, "Willie found a bedbug."

Follow the Leader

A deaf man went to a restaurant with a friend.

"What will you have to eat, sir?"

"Nothing."

"And you, sir?"

"The same as my friend, but with potatoes."

Sure

"Little boy, do your dogs have licenses?"

"Yes, sir! They're just covered with them."

Boarding House Weather

"Ah, your steak is like the weather this evening, madam—rather raw."

"Indeed? By the way, your account is like the weather, too—unsettled."

Pardon the French

"James, after this, please uncork all the bottles in my presence. I notice that when you draw out the corks in the pantry, the wine is extremely decollete."

"Extremely decollete, sir?"

"Yes, James; very low in the neck."

Information, Please

"Do you know anything at all about electrical apparatus?"

"Yes, sir."

"What is an armature?"

"Oh, that's a guy who sings on Major Bowes' program."

Logic

"I can't decide whether to go to a palmist or a mind reader."

"Go to a palmist. It's obvious that you have a palm."

Proper Test

"Try one of these cigars, they're the best thing out."

"Yes, but how are they when lit?"

Explained

Little Tommy was asked the difference between prose and poetry. He pondered awhile and then said, "There was a young lady named Bass who went into the sea to her ankles."

"That's prose," he explained, "but if the water had been a little deeper, it would have been poetry."

Friendship

"How is it, Al, that you make such a profit off your coal? Your price is lower than any other dealer in the city and yet you make extra reductions for your friends?"

"Well, you see, I knock off a dollar a ton because a customer is a friend of mine and then I just take ten bushels off the ton because I'm a friend of his."

Americanized

Replying to the teacher's question who was the first man, the small boy said: "George Washington." Upon being informed that the first man was Adam, he exclaimed: "Well, if you are speaking of foreigners, perhaps he was."

Profitable

"Yes, my daughter's musical education was a profitable venture."

"Really?"

"Yes, I managed to buy the house on either side of my own for about half the real value."

Doctor's Order

"The doctor told my wife she should take exercise."

"And is she doing it?"

"If jumping at conclusions and running up bills can be called exercise."

Growing Out

"Papa, are you growing taller all the time?"

"No, my child. Why do you ask?"

"Cause the top of your head is poking through your hair."

Definition

"Mamma, what does the word 'gentleman' mean?"

"That, my little darling, is a word we ladies generally apply to a man we don't know very well."

Old One

"What model is your car?"

"This car ain't no model—it's a horrible example."

Gott
WATER COOLER
Gotkool
WATER CANS
& COOLERS
GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . .
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Made in 3, 5, 8, 10, and 20 gallon sizes.
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Made in 1½, 3, 5, and 10 gallon sizes.
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

new Merco Type A-24 Concentrator and the Merco Type A-24 Desander has been announced by Clarence J. Brown, vice president of Merco Centrifugal Company, San Francisco.

Sales and engineering staff of the distributorship are under the direction of Edward Sam Self, president. A complete testing laboratory and field testing facilities are maintained to render practical service to drilling operators everywhere in California.

Intermitter

The S. M. Jones Company, Tulsa, has issued a folder on its new Jones-Staggs Intermitter that graphically pictures operation of the gas-lift device and illustrates its use under various conditions.

B. E. Johnston to Represent U. S. Firms in South America

B. E. "Buddy" Johnston, who has been in the United States on business for several weeks, reports that he is returning to South America to represent E. M. Smith Company of Los Angeles, California; Globe Oil Tools Company of Los Nietos, California; and The MacClatchie Company of Compton, California.

As direct factory representative for these companies, he will cover all the active oil fields of Trinidad, Venezuela and Colombia at regular intervals, providing direct contact between the manufacturers and users of their products.

Johnston has been located in South America during the past 12 years, and is familiar with all the South American oil fields.

B. E. JOHNSTON

Osage Metal Company Victor in Patent Suit

Court action brought by the Haynes Stellite Company against the Osage Metal Company, Inc., of Oklahoma City, for alleged infringement of both process and apparatus patents, is invalid, according to a decision of United States Circuit Court of Appeals affirming Judge Murrah's decision in United States District Court for Western District of Oklahoma.

Haynes Stellite Company claimed that Osage Metal Company, Inc., infringed on Claim 2 of patent No. 1,824,976, issued August 29, 1933, covering an apparatus for fusing and casting alloys of high melting temperatures; and Claims 1, 2 and 4 of patent No. 1,962,705, issued June 12, 1934, covering a process for fusing and casting such alloys.

McAdams Guiberson Corporation Representative at New Iberia

R. L. McAdams, formerly at the Guiberson Corporation's warehouse at Kilgore, Texas, has been transferred to South Louisiana where he will be field representative for Guiberson flow valves and other oil field tools. He has made his headquarters at New Iberia.

Prior to his connection with The Guiberson Corporation, McAdams was employed by Gas Lift Sales Company as flow valve sales engineer in East Texas.

Valve Selection

Jenkins Bros., 80 White Street, New York, has issued a book on valve selection, captioned "Jenkins Recommends," designed to eliminate the guesswork in specifying valves for use in connection with boilers, engines, turbines, diesels, pumps, heaters and related equipment.

One diagram is devoted to each unit of equipment and connecting lines indicate accepted practice for installing valves. An identifying letter on each valve refers to a chart where the exact pattern, construction and metal to meet individual requirements can be found.

It's a Fact — Johnston

ONE OF THE FASTEST DRILLING SPEEDS ON RECORD IS THAT MADE AT FORT MORGAN, COLORADO, WHERE THE CREW ON ONE WELL DRILLED 2,375 FEET OF HOLE IN A 24-HOUR PERIOD. THIS HOLE WAS SIMPLY "WASHED" DOWN THROUGH THE SOFT SAND BY THE PRESSURE OF THE CIRCULATING FLUID, WITH PRACTICALLY NO AID FROM THE BIT. THIS NEARLY 100-FT.-PER-HOUR RATE WAS ALMOST AS FAST AS KELLY AND PIPE CONNECTIONS COULD BE MADE—A GOOD WAY TO REDUCE DRILLING COSTS PER FOOT OF HOLE... IF YOU CAN FIND THE RIGHT FORMATION!

BUT HERE'S A BETTER WAY TO REDUCE DRILLING COSTS, AND IT WORKS ON ALL FORMATIONS. RUN THE JOHNSTON FORMATION TESTER EVERY TIME YOU PENETRATE A LIKELY OIL SAND. IT WILL DETERMINE UNDER ACTUAL PRODUCING CONDITIONS EXACTLY HOW THE SAND WILL ACT WHEN PLACED ON PRODUCTION AND WHETHER OR NOT IT WILL BE PROFITABLE TO DEVELOP. WITH THIS INFORMATION, YOU CAN MAKE EACH STRING OF CASING DO THE WORK OF SEVERAL, AND FORGE AHEAD ON YOUR DEVELOPMENT PROGRAM SMOOTHLY, EFFICIENTLY AND INTELLIGENTLY—GETTING FAR BETTER WELLS AT SUBSTANTIALLY LESS COST!

YOUR COPY OF THE JOHNSTON ENGINEERING BROCHURE 33-A, DESCRIBING ACCURATE, SAFE AND DEPENDABLE JOHNSTON TESTING METHODS, WILL BE MAILED FREE ON REQUEST. WRITE TODAY!

Johnston

$$$ FIVE DOLLARS ($5.00) WILL BE PAID FOR EACH INTERESTING OR UNUSUAL FACT CONCERNING THE PETROLEUM INDUSTRY (EITHER IN THE UNITED STATES OR ABROAD) WHICH IS USED IN THIS SERIES OF JOHNSTON ADVERTISEMENTS. SUBSTANTIAL PROOF MUST ACCOMPANY EACH CONTRIBUTION. WHEN TWO OR MORE SIMILAR FACTS ARE SENT IN, THE AWARD WILL BE GIVEN TO THE FIRST ONE RECEIVED ...

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Oil Field Service Corp.
5702 NAVIGATION BLVD.
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"Servicing Mid-Continent and Gulf Coast"

"WHY SET CASING BEFORE YOU KNOW!"

Squeaks from the Bull Wheel

Unfounded Rumor

"I heard that Mabel has a propensity for petting."

"Aw, all she's got is just an old-fashioned sofa like ours."

Uncouth Fellow

"Did that course in English help your boy friend any?"

"No, he still ends every sentence with a proposition."

Old Sweet Song

"If a man says 'I will paddle my own canoe,' he doesn't really mean that he has a canoe or that he is to paddle it. He just means that he will carry on without help.

"Now, can anyone give me another example of a phrase that means something different from what it says?"

"Yes, miss, 'I have been detained late at the office, dear'."

His Definition

"Tommy, what do we mean by nutritious food?"

"Aw it's something to eat that's filling but ain't got no taste to it."

Too Far

"Ellen was arrested because her balloon dance was too daring."

"You mean she went beyond herself?"

"No, just beyond her balloon."

Experienced

The sweet young thing asked me if I could tell her how to play golf.

"Sure, it's easy enough," I told her. "All you do is smack the pill and then walk."

"How interesting," she replied, "just like some auto rides I've been on."

Good Night

The patter of tiny feet was heard from the head of the stairs. The proud mother raised her hand, warning the members of her bridge club to be silent.

"Hush," she said softly, "the children are going to deliver their good-night message. It always gives me a feeling of reverence to hear them. Listen!"

"Mama," came the message in a shrill whisper, "Willie found a bedbug."

Follow the Leader

A deaf man went to a restaurant with a friend.

"What will you have to eat, sir?"

"Nothing."

"And you, sir?"

"The same as my friend, but with potatoes."

Sure

"Little boy, do your dogs have licenses?"

"Yes, sir! They're just covered with them."

Boarding House Weather

"Ah, your steak is like the weather this evening, madam—rather raw."

"Indeed? By the way, your account is like the weather, too—unsettled."

Pardon the French

"James, after this, please uncork all the bottles in my presence. I notice that when you draw out the corks in the pantry, the wine is extremely decollete."

"Extremely decollete, sir?"

"Yes, James; very low in the neck."

Information, Please

"Do you know anything at all about electrical apparatus?"

"Yes, sir."

"What is an armature?"

"Oh, that's a guy who sings on Major Bowes' program."

Logic

"I can't decide whether to go to a palmist or a mind reader."

"Go to a palmist. It's obvious that you have a palm."

Proper Test

"Try one of these cigars, they're the best thing out."

"Yes, but how are they when lit?"

Explained

Little Tommy was asked the difference between prose and poetry. He pondered awhile and then said, "There was a young lady named Bass who went into the sea to her ankles."

"That's prose," he explained, "but if the water had been a little deeper, it would have been poetry."

Friendship

"How is it, Al, that you make such a profit off your coal? Your price is lower than any other dealer in the city and yet you make extra reductions for your friends?"

"Well, you see, I knock off a dollar a ton because a customer is a friend of mine and then I just take ten bushels off the ton because I'm a friend of his."

Americanized

Replying to the teacher's question who was the first man, the small boy said: "George Washington." Upon being informed that the first man was Adam, he exclaimed: "Well, if you are speaking of foreigners, perhaps he was."

Profitable

"Yes, my daughter's musical education was a profitable venture."

"Really?"

"Yes, I managed to buy the house on either side of my own for about half the real value."

Doctor's Order

"The doctor told my wife she should take exercise."

"And is she doing it?"

"If jumping at conclusions and running up bills can be called exercise."

Growing Out

"Papa, are you growing taller all the time?"

"No, my child. Why do you ask?"

"Cause the top of your head is poking through your hair."

Definition

"Mamma, what does the word 'gentleman' mean?"

"That, my little darling, is a word we ladies generally apply to a man we don't know very well."

Old One

"What model is your car?"

"This car ain't no model—it's a horrible example."

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GOTT WATER COOLER
Made in 3, 5, 8, 10, and 20 gallon sizes.
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WATER CANS & COOLERS
GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . .
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7 It lasts longer—gives better service
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There Are 5 BASIC FEATURES ESSENTIAL IN PROPER FLOATING EQUIPMENT

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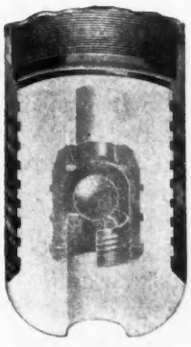
GIVES YOU ALL FIVE



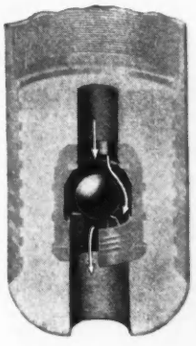
I

(I) STRENGTH. The seamless steel casing shoe into which the concrete plug and Bakelite BALL-TYPE Valve Assembly are securely anchored provides a unit that has the STRENGTH to float the longest and heaviest string of casing with an ample factor of SAFETY.

(II) Ample Circulation Areas. The correctly designed, streamlined Valve Assembly provides passageways ample for any circulating or cementing operation . . . a fact attested to by actual field performance under the most severe operating conditions.

V

(III) Positive, Leak-proof Back-Pressure Valve. The buoyant Bakelite BALL-TYPE Back-Pressure Valve with its multiplicity of seats, floats in the cement slurry or rotary mud and instantly forms a leak-proof double seal against a narrow, tough rubber ring (backed by Bakelite and concrete) at the slightest reversal of pressure. Here is valve efficiency at its best.



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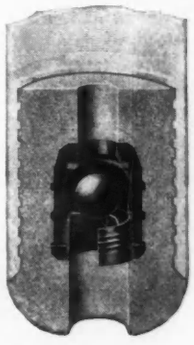
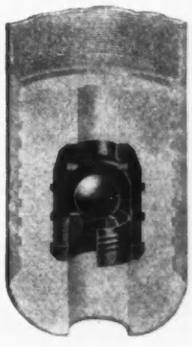


IV

(V) Threaded Connection Furnished to Fit Any Type Casing. Baker Floating Units can be furnished with threaded connection to fit the specifications of your casing. Manufacturing precision assures thread uniformity and accuracy.

(IV) Easy Drillability — results from the internal construction of Baker Formula Concrete and a small amount of Bakelite . . . the Bakelite BALL-TYPE Valve Assembly being set on end in the concrete plug to present a minimum cross-sectional area to the drilling bit. The concrete and the small amount of Bakelite are quickly and easily drilled up and circulated out of the hole.

III



For complete details concerning Baker Cement Guiding, Floating and Cementing Equipment, see Pages 217 to 234 in the 1940 Composite Catalog.

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Acidizing Hand Book takes up the purpose of acidizing, gives full information on formations which are treatable, tells how to determine treatability of formations, how to prepare a well for acidizing, and contains a section of tables extremely valuable to an operator planning to acidize a well.

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The author has had many years of experience in practical work acidizing wells.

The Acidizing Hand Book has a Fabrikoid binding, size 5½ x 8 inches, and contains 78 pages.

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WITH THE EDITOR

Efficient Engineering and Advanced Equipment Overcome High-Pressure Salt Water Flow

EIGHTEEN tests have been drilled in a Louisiana Gulf Coast area, only to be lost in a deep high-pressure salt-water sand. It was not an accident, then, when an operator who previously contributed one of the lost holes successfully drilled through the formation below 10,500 feet. The wildcat is drilling on towards its 12,000-foot objective.

The story behind the conquest of this underground condition reveals efficient application of engineering practices and the latest-type equipment. Particular attention is being paid to mud control, and the weight is being kept constant as the well drills under pressure.

A chemical previously used to fight heaving shale was used in the mud for the first time on this test to carry the bit through the high-pressure salt-water sand.

The drilling outfit is unique in several respects. Mounted on heavy steel barges, submerged in 10 feet of salt water at the drilling site, it includes refinements in heavy-duty equipment not found in any other section of the Gulf Coast. Boilers were designed to operate with the greatest possible saving of fuel oil and feedwater over operations considered normal for the area. Fuel consumption is far below average.

Fuel oil and water are taken to the well site by barge, and the latter must be treated when it reaches the rig. Mud tanks and mud ditches are installed on the lower deck of the drilling barge.

The OIL WEEKLY. Published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.